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THESIS

**THE DIFFERENTIAL IMPACT OF WOMEN'S
PARITICIPATION IN THE ARAB SPRING**

by

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September 2013

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**THE DIFFERENTIAL IMPACT OF WOMEN'S PARTICIPATION IN THE
ARAB SPRING**

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Submitted in partial fulfillment of the
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ABSTRACT

The Arab Spring protests in 2011 uprooted regimes, challenged authoritarian leaders, and provided protesters new tools for mobilization. The use of social media and the involvement of women in public protests indicated changing protest repertoires and movement demographics in many countries. When women protested in 2011, they mobilized both physically and virtually. Assessing the influence women exert in social movements through social media can provide insights into factors that make a social movement successful.

This thesis ascertains that women physically mobilized to participate in the Arab Spring protests in Egypt, Yemen, and Bahrain. In Egypt and Bahrain, women also mobilized virtually using social media, while in Yemen women participated through traditional forms of social mobilization. An assessment of Twitter data in Egypt and Bahrain indicates that women communicated out to others more than their male counterparts, while men received more information from others. Data also indicates that women followed significantly more sources of information than men, thus contributing to the diversity of online protest networks. Notably, women represented nearly fifty percent of the most connected users in the Egyptian Twitter data, communicating to nearly twice as many users and following four times as many information sources, as their male counterparts.

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TABLE OF CONTENTS

I.	INTRODUCTION AND BACKGROUND	1
A.	RESEARCH PROBLEM AND SIGNIFICANCE.....	1
	1. Women, Information Technology, and Social Media in the Middle East.....	2
	2. Significance of Women's Participation in Online Activism.....	5
B.	LITERATURE REVIEW	7
	1. Social Movements.....	8
	2. Social Media and Networks.....	10
	3. Women and Social Movements.....	13
	4. Intersections Between Social Movements, Social Media, and Gender Participation	15
	a. <i>Nonviolence</i>	16
	b. <i>Diversity and Innovation</i>	17
	c. <i>Creation of Group Identities</i>	19
	d. <i>Communications</i>	20
	e. <i>Lowering Costs and Barriers to Protest</i>	21
	f. <i>Summary</i>	22
C.	METHODOLOGY	22
D.	CONCLUSION	25
II.	GENDERED CONTRIBUTIONS TO SOCIAL MOVEMENT SUCCESS	27
A.	INTRODUCTION: ARE WOMEN ORCHESTRATORS?	27
B.	WOMEN'S MOBILIZATION AND NONVIOLENCE: PREFERENCES, PRACTICES, AND OUTCOMES	29
C.	DIVERSITY, INNOVATION, AND WOMEN'S CONTRIBUTIONS	32
D.	GENDER AND THE CREATION OF GROUP IDENTITIES	35
E.	COMMUNICATION AND GENDER.....	37
F.	LOWERED COSTS AND BARRIERS TO PROTEST.....	39
G.	CONCLUSION	40
III.	INTRODUCTION TO THE CASE STUDIES	43
A.	EGYPT.....	44
B.	YEMEN.....	46
C.	BAHRAIN.....	49
D.	SOCIAL MEDIA: THE REVOLUTIONARY'S MEGAPHONE	52
	1. Years of Practice	53
	2. #Mobilization.....	56
	3. Repression.....	58
E.	WOMEN: ON THE STREETS AND ON THE WEB.....	59
	1. Gender and Nonviolent Protest	62
	2. Contributions to Diversity and Innovation.....	63
	3. Collective Identity	64
	4. Communication	65

	5. Lowering Barriers to Protest	67
F.	CONCLUSION	69
IV.	DATA	71
A.	INTRODUCTION.....	71
	1. Key Findings.....	72
	2. Twitter Data	73
B.	EGYPT.....	73
	1. Egypt Centrality Score Comparison	74
	2. Egypt User Activity Comparison.....	76
C.	YEMEN.....	78
D.	BAHRAIN.....	78
	1. Bahrain Centrality Score Comparison	79
	2. Bahrain User Activity Comparison	80
E.	CONCLUSION	81
V.	CONCLUSION	85
A.	DISCUSSION OF FINDINGS	85
B.	AREAS FOR FUTURE RESEARCH.....	89
C.	CONCLUSION	89
APPENDIX.	METHODOLOGY	93
A.	DATA SET.....	94
B.	DATA STRUCTURING.....	94
C.	ANALYSIS	96
	1. Centrality Scores	97
	2. User Activity Measures.....	98
D.	CHALLENGES.....	100
	LIST OF REFERENCES	103
	INITIAL DISTRIBUTION LIST	109

LIST OF TABLES

Table 1.	Centrality Score Comparison for Egypt Users of Interest	76
Table 2.	User Activity Comparison for Egypt Users of Interest.....	77
Table 3.	Centrality Score Comparison for Bahrain Users of Interest	80
Table 4.	User Activity Comparison for Bahrain Users of Interest.....	81
Table 5.	Query Parameters and Results	101
Table 6.	Mapping Fields: Agent x Agent Network.....	101
Table 7.	Topsy Fields Used for Analysis	102

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I. INTRODUCTION AND BACKGROUND

A. RESEARCH PROBLEM AND SIGNIFICANCE

In 2011, the Arab Spring protests swept through the Middle East demanding democracy, challenging authoritarian regimes, and ousting leaders. Recent studies cite longstanding social, economic, and political challenges as the roots of the Arab Spring.¹ As the protests evolved, the use of social media and the involvement of women in public protests garnered public attention and indicated changing protest repertoires and demographics in the Middle East. When women took to the streets in 2011, they also logged onto the Internet, brought their mobile phones, Tweeted, blogged, and demonstrated support through Facebook campaigns. In Egypt, for example, social media empowered women to both engage in online activism and participate in the protests, at the height of the protests in Tahrir Square it is estimated that almost 25 percent of the million protestors were women.² As women engage in the public sphere of social media, how will they affect social movements?

The inclusion of women in social movements can increase the potential for diversity within movements, an important factor in mobilization. Literature reviews of social movements and social media networks stress the importance of diversity in the success of collective action. In cases where the sociocultural barriers of Middle Eastern culture may prevent women from participating publicly in social movements, the incorporation of social media and Web 2.0 technology into the recent protests movements

¹ Sean Aday, Henry Farrell, Marc Lynch, John Sides, and Deen Freelon, "Blogs and Bullets II: New Media and Conflict After the Arab Spring," *Peaceworks*, US Institute of Peace, 80 (2012), 3–5, retrieved November 15, 2012, from <http://www.usip.org/files/resources/PW80.pdf>; Taylor Dewey, Juleian Kaden, Miriam Marks, Shun Matsushima, and Beijing Zhu, "The Impact of Social Media on Social Unrest In the Arab Spring," Stanford University(2012) 50, retrieved October 15, 2012, from http://publicpolicy.stanford.edu/.../SocialMedia_FINAL%2020%20Mar.pdf.

² Sahar Khamis and Katherine Vaughn, "Cyberactivism in the Egyptian Revolution: How Civic Engagement and Citizen Journalism Tilted the Balance," *Arab Media and Society* (summer 2011): 13, retrieved May 1, 2013, from http://www.arabmediasociety.com/countries/index.php?c_article=249.

opened doors for female participation.³ Women like Asmaa Mahfouz in Egypt, Zeinab al—Khawaja in Bahrain, and Shatha al—Hazari in Yemen utilized social media and the Internet to express ideas, coordinate action, and challenge the status quo.⁴ While writers assert that women made a difference through their virtual activism or actual mobilization, it is harder to quantify how successful these women have been in shaping social movements through their use of social media tools. How do women influence social movements through their use of social media? Furthermore, do women use social media differently while participating in social movements, and to what extent does female participation via social media influence the success of a social movement, particularly in gender segregated environments? This thesis tests the hypothesis that women in the Middle East have a differential impact on social movements through their online activism and employment of social media.

1. Women, Information Technology, and Social Media in the Middle East

As the Arab Spring protests took place in the Middle East, women, a group largely perceived as marginalized in Middle Eastern cultures and societies, firmly established a presence in online social media sites and virtual social movement networks that were traditionally considered public and masculine spaces.⁵ The presence of women online is not only unlikely to recede, but will become more prominent with the increase in women's literacy and education, computer training initiatives, and the growing view of Internet technologies as a source both information and empowerment. While women may

³ "Arab Social Media Report: The Role of Social Media in Arab Women's Empowerment," *Arab Social Media Report* 1, no. 3 (2011), retrieved November, 1 2012, from <http://www.arabsocialmediareport.com/UserManagement/PDF/ASMR%20Report%203.pdf>; Courtney Radsch, "Arab Media: Unveiling the Revolutionaries: Cyber Activism and the Role of Women in the Arab Uprisings," (2012), 5–7, retrieved October 1, 2012, from <http://www.radsch.info/2012/05/unveiling-revolutionaries-cyberactivism.html>.

⁴ Radsch, "Unveiling the Revolutionaries," 5–7.

⁵ Victoria A Newsom and Lara Lengel, "Arab Women, Social Media, and the Arab Spring: Applying the Framework of Digital Reflexivity to Analyze Gender and Online Activism," *Journal of International Women's Studies* 13, no. 5 (2012): 37.

be represented in smaller numbers in the Middle East cyber domain, their presence online is reflective of more than a decade of training and education initiatives on a global and regional scale.

As early as 1992, women's organizations began to incorporate email and conferencing.⁶ In 1995 the Fourth World Conference in Beijing demonstrated the desire of women's Non-Governmental Organizations (NGOs) to use email for coordination, and by 1997, the Global Knowledge Conferences began to focus on ways ahead for gender and Internet Communications Technologies.⁷ Women's use of technology in the Middle East is not a new issue; in fact, the last decade has offered a series of conferences devoted to women and technology hosted in multiple Arab countries.⁸

Clearly, many Middle Eastern countries' promotion of women's use of ICT education may be disingenuous, a means to influence international support instead of focusing on women's rights.⁹ Yet, even if this is the case, the tangential effect is still a net benefit for women: women are being trained on ICT and are using these technologies, and have new opportunities to participate in social movements through ICT.¹⁰ As the Internet grows as a resource for the creation of political and cultural activism, individuals must understand how both activism online and activism in the local area works in order to employ ICT successfully in support of social movements.¹¹ Skalli notes that women's

⁶ Wendy Harcourt, *Women@ Internet: Creating New Cultures in Cyberspace* (London: Zed Books, 1999), 93–99.

⁷ Ibid., 93–99.

⁸ Loubna H. Skalli, "Communicating Gender in the Public Sphere: Women and Information Technologies in the Mena Region," *Journal of Middle East Women's Studies* 2, no. 2 (2006): 42–43, 51, retrieved November 15, 2013, from http://muse.jhu.edu/journals/journal_of_middle_east_womens_studies/v002/2.2skalli.html. In 1999, the Arab Women Media Center was founded in Jordan, following this, Cairo hosted the Extraordinary Arab Women's Summit in 2000, and Abu Dhabi hosted the first "Women and Media Forum" in 2002. The first regional conference on Women and Information/Communication Technologies (ICT) was held in Cairo in 2003, which established the Information Technology Arab Regional Women Task Force to prepare for the World Summit of the Information Society in Tunisia.

⁹ Harcourt, *Women@ Internet*, 217.

¹⁰ Ibid.

¹¹ Arturo Escobar, "Gender, Place and Networks: A Political Ecology of Cyberculture," in Harcourt, *Women@ Internet*, 32.

ICT training enables women with access to uncensored information, increases women's activities and concerns both intra and extra regionally, and drives women to broaden their horizons.¹² She further states that women in the Middle East are using the private spaces provided by Internet communities as places to organize, train, and coordinate activities.¹³ Women, embedded in the daily life of their communities, understand the local networks, and with increased education and ICT training may be well suited to link local and online networks.¹⁴

The challenge, however, despite the appeal of the Internet, lies in the literacy and status of women in the Arab world, as well as the censorship of the Arab world from mass media.¹⁵ The Arab Social Media report identifies a gender gap in cyberspace: women's Internet use in the Middle East, in particular social media tools such as Facebook, is lower than the global average. Regional opinion polls cite the two most significant reasons for this gap as societal or cultural limitations and privacy concerns; national opinion polls reflect a similar trend with an even greater focus on societal/cultural limitations.¹⁶ Issues with the perception of women's empowerment also create challenges. Newsom and Lengel argue that gendered messages lose their influence as western media adopts them, asserting that as messages lose their power, their authors are marginalized, and the messages are reconstructed to fit in a global, instead of local, narrative.¹⁷ Many female activists, such as Tawakkol Karman and Asmaa Mahfouz were lauded for their bravery by the western world, yet their Islamic beliefs, or in Karman's case years of participation in Islamist charities and activities that resonate with local

¹² Skalli, "Communicating Gender," 51.

¹³ Ibid., 37–38.

¹⁴ Valentine M Moghadam, *Globalization and Social Movements: Islamism, Feminism, and the Global Justice Movement* (Lanham, MD: Rowman & Littlefield, 2009), 123.

¹⁵ Harcourt, *Women@ Internet*, 214–216.

¹⁶ "Social Media in Arab Women's Empowerment," in *Arab Social Media Report*, 5.

¹⁷ Newsom and Lengel, "Arab Women, Social Media, and the Arab Spring," 32.

cultural narratives, frequently went unmentioned.¹⁸ They view the use of online communities by women as a form of “contained empowerment” as it may not result in empowerment offline, since social norms that are suspended online come into play again in the real world, thus limiting opportunities for change.¹⁹ Whether women are truly empowered online or not, their participation still offers an opportunity to set an alternative and potentially nonviolent agenda, diversify the protest repertoire, create more inclusive group identities, better communicate an agenda to a wider audience, and develop trust networks that lower barriers to protest as will be shown below.

2. Significance of Women’s Participation in Online Activism

Assessing the influence women exert in social movements through social media may provide indicators of the potential a protest movement has for success. In the Middle East, where gender segregation is common, the gender—neutral space of the Internet provides a forum for women to circumvent social barriers and participate in public discourse.²⁰ This participation can shape female perceptions of the grievances of a social movement, create a sense of connection with other protestors, and make women more prone to collective action. Female participation through social media in social movements can plausibly influence key factors related to movement success.

Studying women’s participation in social movements in general can help assess the possibility for the use of violent tactics within a movement. Studies show that nonviolent protest movements are twice as successful as violent protest movements, and nonviolent movements experience a greater potential for democratic transition if a regime is overthrown and are less likely to experience civil war than violent movements.²¹ Women have a preference for nonviolence and apparently influence movements in a

¹⁸ Manuel Castells, *Networks of Outrage and Hope* (New York: Polity Press, 2012), 53–56; Stacy Philbrick Yadav, “Tawakkul Karman as Cause and Effect,” *Middle East Research and Information Project* (2011), retrieved May 15, 2013, from <http://www.merip.org/mero/mero102111>.

¹⁹ Ibid., 38.

²⁰ “Social Media in Arab Women’s Empowerment,” in *Arab Social Media Report*, 9.

²¹ Erica Chenoweth and Maria J. Stephan, *Why Civil Resistance Works: The Strategic Logic of Nonviolent Conflict* (New York: Columbia University Press, 2011), 35, 201–202.

nonviolent direction. A recent study on factors influencing the choice of nonviolent protest repertoires indicates that “gender inclusive ideologies” have a strong correlation to peaceful protest tactics.²² Research also shows that women have a more negative reaction to violence and war compared to men, and have a preference for peace.²³ Additional research shows an important indicator of a state’s potential to be less militaristic is associated with higher levels of gender equality.²⁴ If women do bring a preference for nonviolence into a more gender equivalent forum such as the Internet, they may help shape collective action within a movement, to include influencing the conduct of physical protests and the use of violence tactics.

In determining how women use social media during social movements and the consequential impact, more robust assessments of the diversity, resilience, and strength of a social movement need to be made. Female participation in a social movement adds diversity to the group, which increases the resilience of the movement and its ability to survive regime repression and adapt to changing circumstances.²⁵ If women are using social media as tool to participate in social movements, the means by and extent to which they influence protest strategies may indicate a social movement’s potential for success.

With the increasing involvement of cyber operations and planning in US strategy, understanding gendered participation on social media may provide a window into the dynamics and actors who can minimize negative and violent outcomes. As the US government places more emphasis on political, economic, and social programs that include women, the ability to effectively identify and engage the most influential females in a group or organization will be critical to the success of these initiatives. Recognizing

²² Victor Asal, Richard Legault, Ora Szekely, and Jonathan Wilkenfeld, “Gender Ideologies and Forms of Contentious Mobilization in the Middle East,” *Journal of Peace Research* 50, no. 3 (2013): 315.

²³ Pamela Jonson Conover and Virginia Sapiro, “Gender, Feminist Consciousness, and War,” *American Journal of Political Science* 37, no. 4 (1993): 1096-1097, <http://www.jstor.org/stable/2111544>; Yaacov B. Yablon, “Gender Differences in the Consistency of Attitudes towards Peace,” *Women’s Studies International Forum* 32, no 4 (2009): 305–310, retrieved December 12, 2012, from <http://www.sciencedirect.com/science/journal/02775395/32/4>.

²⁴ Mary Caprioli, “Gendered Conflict,” *Journal of Peace Research* 37, no. 1 (2000): 63, <http://www.jstor.org/stable/425725>.

²⁵ Chenoweth and Stephan, *Why Civil Resistance Works*, 39–40.

the effectiveness of female social media use in social movements can help tailor US strategy and policy for both strategic and operational planning assessments.

B. LITERATURE REVIEW

Several strands of literature are relevant to understanding a potential differential impact of women's use of social media in social movements in the Middle East. Three primary literature concentrations contribute to this research question: social movements, social media and virtual networks, and female involvement in social movements. Each of these literatures has some common insights: social media can be used to enhance social movements, female participation in social movements has the potential to change the composition of a movement, thereby increasing the chances of success, and women in recent protests have been active on social media. As these themes begin to overlap, questions arise, such as, do women bring an active preference for nonviolence into online social movement discourse?²⁶ Do women bring a different physical network of associates into the world of social media with them, and does that increase the size and diversity of online social movements? Given the gender segregation of public and private spaces, are women using the Internet to circumvent cultural limitations and enter the public sphere?²⁷ If they are using the Internet to engage in public debate, are women also strategically employing the Internet and social media to reach different audiences, international media, members of online groups, or potential online activists? If violent protests or household responsibilities inhibit women's mobilization, how are they using social media to voice their support for protests, and are their efforts effective?²⁸ The research on social movement theory, social media use, and women's engagement in both may provide some potential insights. After reviewing the three central themes, this review will focus on concepts that overlap between the camps.

²⁶ Conover and Sapiro, "Gender, Feminist Consciousness and War," 1096–1097.

²⁷ Radsch, "Unveiling the Revolutionaries," 36, 40.

²⁸ Ibid., 35–36.

1. Social Movements

Studies on social movements in the Middle East identify collective action that is nonviolent as a critical factor in successful social movements, and nonviolence can potentially be enhanced through social media use and more specifically through female participation. Studies on social movements widely recognize such movements as informally organized groups of individuals lacking political representation, possessing specific complaints, and having objectives for change. Tilly's definition of social movements encompasses many of these facets: he defines social movements as:

A sustained series of interactions between power holders and persons successfully claiming to speak on behalf of a constituency lacking formal representation, in the course of which those persons make publicly visible demands for changes in the distribution or exercise of power, and back those demands with public demonstrations of support.²⁹

In keeping with the main points of this definition, uprisings in the Middle East against authoritarian regimes fit well within these standards, to include the Palestinian Intifadas, Egypt's Kefaya movement in 2005, and the protests that swept the Middle East during the Arab Spring. With the second Intifada being the exception, the majority of the aforementioned uprisings are noteworthy for the absence of significant violence on the part of the protestors.

Nonviolent collective action has been studied and identified as a crucial element to the success of social movements against authoritarian regimes. Sharp defines nonviolent struggle as society's use of economic, political, psychological, and social power to undercut a regime's authority, and contends that nonviolence is uniquely suited to forcing change in repressive regimes.³⁰ The "repertoire" or ways of mobilizing of such protests can incorporate almost 200 different techniques, including strikes, boycotts,

²⁹ Charles Tilly, "Social Movements and National Politics," in *Statemaking and Social Movements: Essays in History and Theory*, eds. Charles Bright and Susan Friend Harding (Ann Arbor, MI: University of Michigan Press, 1984), 297–317.

³⁰ Gene Sharp, "From Dictatorship to Democracy: A Conceptual Framework for Liberation," Albert Einstein Institution (2003): 38, retrieved October 15, 2012, from <http://www.aeinstein.org/organizations892f.html>.

protests, stay-aways, sit-ins and other forms of non-violent protests.³¹ Sharp's discourse on undermining the pillars of support that repressive regimes rely on to secure their power through diverse methods has been promoted throughout many regions of the world, including the Middle East.

In studies on the comparative potential that nonviolent social movements have to achieve the desired objective, Chenoweth and Stephen found that nonviolent movements have a 53 percent chance of success compared to a 23 percent chance of success in violent movements.³² Chenoweth and Stephen stress that while there are failed nonviolent campaigns as well as successful violent campaigns, nonviolent social movements have a higher potential for success than violent campaigns when there is wide, diverse participation.³³ Additionally, participation influences the success of a social movement. Nonviolent movements provide an advantage over violent movements as they encourage greater participation, as there are fewer challenges with respect to "moral, physical, informational, or commitment" issues of the participants.³⁴ Nonviolent campaigns present a wider array of options and opportunities to participate as well as provide openings for women, elderly, and minority groups to participate.³⁵

The Arab Spring protests represent the most recent iteration of predominantly nonviolent social movements within the Middle East, the protests experienced some success in either ousting the regime or gaining more political freedom. Stephen identifies that nonviolent social movements in the Middle East are common, detailing case studies of nonviolent civil resistance throughout the region including Egypt, Iran, and the Occupied Territories.³⁶ The first Palestinian Intifada during the late 1980s demonstrated

³¹ Sharp, "From Dictatorship to Democracy," 78–79.

³² Maria J. Stephan and Erica Chenoweth, "Why Civil Resistance Works: The Strategic Logic of Nonviolent Conflict," *International Security* 33, no. 1 (2008): 8, retrieved November 1, 2012, from http://muse.jhu.edu/journals/international_security/v033/33.1.stephan.html.

³³ Chenoweth and Stephan, *Why Civil Resistance Works*, 39.

³⁴ *Ibid.*, 35.

³⁵ *Ibid.*

³⁶ Maria J. Stephan, *Civilian Jihad: Nonviolent Struggle, Democratization, and Governance in the Middle East* (New York: Palgrave Macmillan, 2009), 8–9.

the impact of noncooperation and its ability to produce a rich, unified, civil society.³⁷ While the Intifada's objective of a Palestinian state did not occur, the Intifada was successful in disrupting Israeli society. Notably, Palestinian leadership met with Sharp in 1989 to refine and implement an effective strategy of nonviolent struggle.³⁸ The Arab Spring protests applied similar techniques of nonviolent struggle, and employed many of Sharp's recommendations in conjunction with modern media and communications technology to engage a diverse body of protestors in their collective action repertoire. Women were part of the diverse body of protestors both on the Internet and in the streets.

2. Social Media and Networks

Studies show that social media can facilitate extensive collective action but it can also weaken collective action networks. Though used extensively in the Arab Spring, social media is not viewed as crucial to the success of the uprisings. Social media can produce diverse, participative, networks that can be used to organize and develop elements of a social movement. Anklam identifies the capacity for technology to establish interactions that form relationships, stating that the Web 2.0 is both "universally available and deeply participative," which inherently provides networks with high levels of transparency, diversity, and openness.³⁹ She also notes the importance of human capital including individual knowledge, skills, and experiences, structural capital consisting of the processes, procedures and structures crucial to network function, and relational capital built upon the value of an organization.⁴⁰ Anklam does not specify whether the value of network growth and shared experience changes between virtual and actual networks.

Bennett argues that while the use of Internet technology can contribute to social movements, it also facilitates weak ties and can damage campaigns. He also posits that

³⁷ Ibid., 151.

³⁸ Peter Ackerman and Jack DuVall, *A Force More Powerful: A Century of Non-Violent Conflict*(Basingstoke, UK: Palgrave, 2001), 419.

³⁹ Patricia Anklam, *Net Work: A Practical Guide to Creating and Sustaining Networks at Work and in the World*(Amsterdam, NL: Elsevier/Butterworth-Heinemann, 2007), 222–223.

⁴⁰ Ibid., 14.

the ease of entry and exit into networks by virtue of digital communications may negatively affect the capacity to control a campaign or create a collective identity that supports movement longevity; thus women's use of social media would do little to enhance a social movement.⁴¹ However, Bennett also recognizes that the Internet favors "resource—poor players," increases opportunities to join activist organizations, and Internet campaigns allow activists to plan and coordinate more opportunities for both virtual and physical mobilization.⁴² Whether Internet use in a campaign has a positive or negative impact, Bennett ultimately argues that "resource poor organizations may be defined in important ways by their Internet presence."⁴³

Van Laer and Van Aelst also discuss the weak ties digital communications produce. They posit that the reduced level of trust required among protest participants is potentially damaging to a social movement; however, they also acknowledge that the Internet has encouraged the creation of a digital repertoire for, and lowered barriers to, collective action in social movements.⁴⁴ They hold the view that the Internet serves in a "facilitating" capacity, making traditional forms of collective action easier to coordinate and lowering barriers to protest, as well as in a "creative" capacity, producing diversity through new tactics and information diffusion.⁴⁵ While Bennett, Van Laer, and Van Aelst's studies show that digital networks may be ineffective tools for women to engage in social movement dialogue, they also indicate that digital networks may lower barriers for women to participate in social movements.

Recent studies on social movement application of social media in the Middle East reflect the aforementioned dichotomy and concede that social media is a useful tool, but

⁴¹ William Bennett, "Communicating Global Activism," *Information, Communication & Society* 6, no. 2 (2003): 145, doi:10.1080/1369118032000093860.

⁴² *Ibid.*, 143, 153.

⁴³ *Ibid.*, 145.

⁴⁴ Jeroen Van Laer and Peter Van Aelst, "Internet and Social Movement Repertoires," *Information, Communication & Society* 13, no 8 (2010): 15, doi: 10.1080/13691181003628307.

⁴⁵ *Ibid.*, 3.

it is not an indispensable tool for the success of social movements.⁴⁶ Findings did not indicate that social media use affected the success of mass protests; however, research did show that the civil societies formed by Internet communities likely increased participation to a degree and gained international attention.⁴⁷ Studies found social media helped organize protests, communicate to the world, and bolster the traditional mechanisms for driving collective action.⁴⁸

Reports on social media use in the Arab Spring cite the underlying social, economic, and political conditions as the causes for the protests; however, each study acknowledges that the Internet, social media, or new communications technology did affect how movements organized, coordinated, or discussed activity. A Stanford University study noted the underlying causes of the Arab Spring, but still noted that social media provided forums for activists to coordinate, discuss, and disseminate information, stressing the capacity for social media to create virtual civil societies.⁴⁹ Peaceworks offered a similar conclusion, stating that while new media did play a role in the Arab Spring uprisings, it did not play a significant role in mobilizing activists or inspiring other uprisings in the region.⁵⁰ The study further observes that the effects of new media in the Arab spring did have a significant role in spreading information extra-regionally, linking activists to the public masses, and spreading local news to international news outlets.⁵¹

One of the notable effects of social media on recent social movement organization is the growing participation of women in social media as part of protest movements.

⁴⁶ Dewey et al., "Impact of Social Media," 49; Philip N. Howard, Aiden Duffy, Deen Freelon, Muzammil Hussain, Will Mari, and Marwa Mazaid, "Opening Closed Regimes: What was the Role of Social Media During the Arab Spring," Project on Information Technology and Political Islam (2011), 23, retrieved November 1, 2012, from http://dl.dropbox.com/u/12947477/publications/2011_Howard-Duffy-Freelon-Hussain-Mari-Mazaid_pITPI.pdf.

⁴⁷ Howard et al., "Opening Closed Regimes," viii.

⁴⁸ Ibid., 31.

⁴⁹ Dewey et al., "Impact of Social Media," 32, 50.

⁵⁰ Aday et al., "Blogs and Bullets II," 3.

⁵¹ Ibid., 3–5.

Studies stress the diversity and innovation they bring to social movements through cyberactivism.⁵² Radsch studies how women participated in social movements through social media, and cited case studied throughout the Middle East of women who blogged, Tweeted, and used Facebook to participate in the Arab Spring uprisings.⁵³ Her study indicates that women who used social media in support of social movements were eager to participate, shared a sense of connection to others in the movement, and wanted to inform others about the movement's goals and actions.⁵⁴ There is evidence that women played a key role in recent social movements such as the Arab Spring, both virtually and physically, but the actual effectiveness of their contributions have yet to be quantified.

3. Women and Social Movements

In the Middle East, gender segregation represents a distinct challenge to female participation in public life and collective action. Roth contends that one of the significant challenges women face in social movements, whether driven by one or both genders, is a consensus that the public sphere is often male—driven, while the private social sphere belongs to females.⁵⁵ Thus, female participation in social movements affects both the public sphere, as well as private life at home, posing a greater challenge and threat to existing social norms as well as political orders.⁵⁶ As women gain more access to social media, their participation in social movements through social media will grow, contribute to these movements, and challenge traditional gender norms. Social media may provide a way for women to effectively voice their opinions in protest movements without challenging social or cultural mores that would otherwise restrict participation.

Social media participation by women is not a break from the past. Female participation in social movements has been a factor in recent social movements in the

⁵² Skalli, "Communicating Gender;" Radsch, "Unveiling the Revolutionaries."

⁵³ Radsch, "Unveiling the Revolutionaries."

⁵⁴ Ibid.

⁵⁵ Benita Roth and Marian Horan, *What are Social Movements and What is Gendered About Women's Participation in Social Movements?* (Binghamton, NY: State University of New York, 2001), 3.

⁵⁶ Ibid.

Middle East, providing women with opportunities to learn how to contribute to social movements and collective action. One of the earliest instances of significant female participation in social movements in the region took place during the first Palestinian Intifada. Women took assumed leading role in the Intifadas, leading civil society organizations, creating grass roots institutions, and appearing regularly at strikes, protests, and demonstrations. They often served as couriers and coordinators between different groups; their extensive participation from the inception of the social movement shifted the relationships between Palestinian men and women in public life.⁵⁷ In other examples, women in Egypt participated in the Kefaya movement in 2005, Persian women formed part of the Green Revolution in Iran in 2009, and Saudi women protested for their right to drive in 2010.⁵⁸

Women's presence on the Internet and in social media is growing in the Middle East, albeit slowly. This increased presence enables women to bring new discourse to virtual public forums. Skalli details the continuing evolution of female Internet use in the Middle East with respect to activist movements, in particular through diverse communications methods and techniques. She states that modern media is offering women a new forum to discuss gender, societal, economic, and political issues. Ultimately, Skalli claims "The impact of women's interventions and initiatives are often more subtle and symbolic than openly radical or revolutionary—this is precisely how women activists bargain with the structures of patriarchy in the MENA."⁵⁹ Access to the new forum of the Internet, however, is limited for many women. A 2002 sampling of women in the Middle East identified that women at the time lagged behind men in their use of the Internet due to challenges in literacy, computer literacy, physical access to computers, and sociocultural constraints. Of the women that were regular Internet users, they represented an elite, educated, professional class of women that used the Internet primarily for work and secondarily for entertainment and to connect with friends and

⁵⁷ Ralph Crow, Phillip Grant, and Saad Eddin Ibrahim, *Arab Nonviolent Political Struggle in the Middle East* (Boulder, CO: Lynne Rienner, 1990), 67.

⁵⁸ Radsch, "Unveiling the Revolutionaries," 9, 14, 39.

⁵⁹ Skalli, "Communicating Gender," 39, 51–53.

family.⁶⁰ While some of the constraints on female Internet use may still remain, the Arab Social Media Report indicates a common belief that social media may help balance out genders. More than 80 percent of both male and female respondents believed that social media made it easier for Arab women to communicate their opinions as well as participate in civil society. This supports the idea that women do have a voice in a social movement through their use of social media.⁶¹

The incorporation of women into Middle Eastern social movements resulted in more women seeking opportunities for participation, including opportunities to participate through the use of the Internet and social media. Radsch's study of women's cyber activism during the Arab Spring presents a wide array of examples of female participation through social media. She explored the ways that women communicated through social media, to include specifically targeting international media, bridging the Arabic-English divide, Yemeni women using video dumps to get social media footage onto regional television, and Libyan women spamming journalists and commentators in order to amplify their message.⁶² She cites the perception of gender equality on the Internet and contends that cyber activism may be more socially acceptable than physical mobilization into the public sphere.⁶³

4. Intersections Between Social Movements, Social Media, and Gender Participation

Women's participation in social movements, as well as the use of social media to participate in social movements, has potential to enhance many of the factors that contribute to the success of collective action, including nonviolent action, diversity and innovation, the creation of group identities, communication, and lowering costs and

⁶⁰ Deborah Wheeler, "Blessings and Curses: Women and the Internet Revolution in the Arab World," in *Women and Media in the Middle East: Power through Self-Expression*, edited by Naomi Sakr (London: IB Tauris, 2004), 160.

⁶¹ "Social Media in Arab Women's Empowerment," in *Arab Social Media Report*, 6–9.

⁶² Radsch, "Unveiling the Revolutionaries," 14–18.

⁶³ *Ibid.*, 29.

barriers to participation.⁶⁴ These junctures represent indicators that may identify if and how women's use of social media while participating in social movements contributes to movement success.

a. Nonviolence

Successful nonviolent collective action requires wide, diverse participation that includes the involvement of women and minorities. Inclusive participation can be coordinated and reinforced through the use of social media. A recent study of factors that influence the use of violence showed a strong correlation between organizations with “gender inclusive ideologies” and a propensity to select nonviolent protest repertoires, indicating that positive views of women's participation can lead to more peaceful protest activity.⁶⁵ In addition to less violent protests, the gendering of a protest movement may decrease the perception of the movement as a threat, which may lower the possibility of violent repression by security forces.⁶⁶ Nonviolent campaigns present a wider array of options and opportunities for participation, to include opportunities for women and elderly citizens to participate.⁶⁷

If the protest repertoire is varied and contains lower—risk activities, wider participation can be solicited.⁶⁸ This not only increases the size of the protest movement, but also increases the variety of skills and knowledge that participants bring to the movement. Nonviolent movements also create less disruption to daily life, enabling people to continue with their jobs and feed their families.

Social media can create the perception of mass participation in a protest and spread news of regime repression, creating backlash against the government, and

⁶⁴ Sharp, “From Dictatorship to Democracy;” Chenoweth and Stephen, *Why Civil Resistance Works*.

⁶⁵ Asal et al., “Gender Ideologies,” 315.

⁶⁶ Ronald R. Aminzade and Doug McAdam, “Emotions and Contentious Politics” in *Silence and Voice in the Study of Contentious Politics*, ed. Ronald Aminzade (Cambridge, UK: Cambridge University Press, 2001). 35

⁶⁷ Chenoweth and Stephen, *Why Civil Resistance Works*, 35.

⁶⁸ Ibid., 38.

further engendering support.⁶⁹ If social media is used to coordinate protests, instructions to protestors can be communicated to a wider audience, laying some of the groundwork for how a protest is executed and the level of violence. Additionally, if the virtual network includes women, women are included in discourse and as studies of the Arab Spring have shown, and may mobilize virtually or physically.⁷⁰ Both social media and female participation in social movements can enhance nonviolent collective action. When women participate in online social movement discourse, they have an opportunity to influence the conduct of collective action.

b. Diversity and Innovation

The incorporation of both genders in a social movement as well as the use of social media to solicit knowledge from a large, mixed-gender pool of supporters and participants enhances the diversity and innovation of a social movement. The diversity of participants brings innovation and resilience to a social movement. Diversity in gender, age, religion, and ethnicity can undermine a regime's ability to surgically coerce a segment of society into cooperating.⁷¹ As a social movement gains participants, the potential for heterogeneity and consequently, diversity, innovation, and movement resilience grows. Studies on critical mass and collective action note that there is a small subset of resource contributors within a group that form the "critical mass" necessary to produce collective action; however, the effectiveness of that group increases with the diversity of the population participating in that collective action.⁷² Furthermore, research found that group size, heterogeneity, and dense social ties all increased the potential for collective action.⁷³

⁶⁹ Ibid., 50.

⁷⁰ Radsch, "Unveiling the Revolutionaries."

⁷¹ Chenoweth and Stephen, *Why Civil Resistance Works*, 39–40.

⁷² Pamela Oliver, Gerald Marwell, and Ruy Teixeira, "A Theory of the Critical Mass. I. Interdependence, Group Heterogeneity, and the Production of Collective Action," *American Journal of Sociology* 91, no 3 (1985): 524, <http://www.jstor.org/stable/2780201>.

⁷³ Pamela Oliver and Gerald Marwell, "The Paradox of Group Size in Collective Action: A Theory of the Critical Mass. II," *American Sociological Review* (1988): 1, <http://www.jstor.org/stable/2095728>.

Group heterogeneity can facilitate access to a wider range of knowledge and skills. Research on applying “critical mass” to interactive media identifies that the requisite interaction and reciprocation that is part of the nature of interactive media creates increased benefits for participants as participant contributions increase. This “accelerating production function” is due to the interests, resources, and heterogeneity involved in the interaction.⁷⁴ Essentially, more participation, leads to more benefits for the group, which increases activity within the group, which encourages more contribution and participation.

Additional studies on the use of the Internet and social and media in social movements continue to stress the importance of diversity and innovation to enhance narratives and develop new participation methods. Bennett argues that digital networks form weak ties through narratives instead of ideology, but notes that the diversity of individual identity bolsters these ideologically thin connections.⁷⁵ The Internet and features such as social media serve as a tool that, by virtue of being a “many-to-many” medium, engenders diversity and reduces contributor costs.⁷⁶ A study on chat channel survival identified that it was not the number of participants, but the heterogeneity of participants that was most significant indicator of channel longevity and survival, noting that the diversity of the participants formed early and was a predominant indicator for survival of the virtual chat networks.⁷⁷ Participation of both genders in these virtual and physical networks increases heterogeneity. Skalli contends that women are using modern media to diversify their participation methods in activist movements and cites the increasing prominence of the Internet with the growth of Internet cafes and opportunities for technological education.⁷⁸ Qualitative studies detail the diverse techniques women

⁷⁴ M. Lynne Markus, “Toward a ‘Critical Mass’ Theory of Interactive Media Universal Access, Interdependence, and Diffusion,” *Communication Research* 14, no. 5 (1987): 499, doi: 10.1177/009365087014005003.

⁷⁵ Bennett, “Communicating Global Activism,” 146–147, 150.

⁷⁶ Van Laer and Van Aelst, “Internet and Social Movement Repertoires,” 6.

⁷⁷ Daphne Raban, Mihai Moldovan, and Quentin Jones, “An Empirical Study of Critical Mass and Online Community Survival,” in *Proceedings of the 2010 ACM Conference on Computer Supported Cooperative Work*, Association for Computing Machinery (2010): 78–79, doi: 10.1145/1718918.1718932.

⁷⁸ Skalli, “Communicating Gender,” 39, 51–53.

brought to social movements in the Middle East. The quantitative effect of their efforts on shaping collective action is harder to discern.⁷⁹ If women are regular participants in social movements online, they can contribute both to group heterogeneity and the interaction between members of the group, which increases the benefits to those participating in group discourse as well as the chance of movement longevity.

c. Creation of Group Identities

Participation in social movement discourse through social media shapes group identities for a wide audience. The participation of both sexes in online discourse can shape the group narrative around which a community mobilizes. In their examination of social movements, Porta and Diani identify two methods of analyzing collective action and culture, the first being through values that activists pair with concerns and the second being the ways that actors place meaning on experiences.⁸⁰ The values and meanings of collective action are part of the creation of group identity, which is essential to collective action.⁸¹ Bennett notes that digital networks, through the creation of narratives, can reinforce group identities.⁸² Social media and modern communications can reinforce the creation and communication of group identities. As interactive media participation encourages activity, and that activity for one member constitutes participation for another, the participation of a diverse group of people can shape group identity through these interactions.⁸³ When women participate in discourse through the gender-neutral space of social media, they have the potential to influence group identity.

⁷⁹ Radsch, “Unveiling the Revolutionaries;” “Social Media in Arab Women’s Empowerment” in *Arab Social Media Report*.

⁸⁰ Donatella Della Porta and Mario Diani, *Social Movements: An Introduction* (Oxford, UK: Blackwell, 1999), 87.

⁸¹ Della Porta and Diani, *Social Movements*, 113.

⁸² Bennett, “Communicating Global Activism,” 146–150.

⁸³ Markus, “Toward a ‘Critical Mass’,” 505.

d. Communications

Studies show that social movements in the Middle East employed the Internet and social media to improve communication and coordination between group members. Along with this adaptation, women have also demonstrated their willingness to participate in online communication. The communication methods that social media offers can help shape social movements, allowing communications to circumvent regime oppression, link groups, and coordinate collective action faster. Sharp's resistance techniques for social intervention, lists "Alternate Social Institutions" and "Alternate Communications Systems," which many of the features of modern communications technology facilitate.⁸⁴

In the first Palestinian Intifada, paper communiqués were issued from local leadership; in the Arab Spring, Facebook and Twitter served as an alternate form of communication. Stephan cites the Egyptian Kefaya movement in 2005, and later the April 6 civil strikes as applications of nonviolent protest that took advantage of new communications technology such as the growing Internet to communicate to a wider population for mobilization and support.⁸⁵ Stephan stresses the importance of using communications to engage activists as well as movement supporters, neutral groups, and opponent supporters.⁸⁶ Stephen conveys that modern communications technology is being used to engage activists and non-activists alike, emphasizing shared values and engaging other supporters.⁸⁷

Bennett offers a counterpoint that given the thin ties of digital networks, there is a greater chance for disrupted communications and confusion; however he does recognize the benefits of digital communication in network coordination and resilience. He states, "The same qualities that make these communication-based politics durable also

⁸⁴ Sharp, "From Dictatorship to Democracy," 94.

⁸⁵ Stephan, *Civilian Jihad*, 214. During the April 6 civil strike, Facebook served as a tool to inform and encourage protestors to strike.

⁸⁶ Ibid., 27.

⁸⁷ Ibid.

make them vulnerable to problems of control, decision-making, and collective identity.”⁸⁸ A Stanford University study argued that social media provided forums for social activists to coordinate, discuss, and disseminate information.⁸⁹ Radsch cites a plethora of examples of how women used the Internet for social activism, however, there is little quantitative information on how and why women were successful in their cyber activism.⁹⁰ Women’s use of social media creates prospects to expand communication to other activists and non-activists as well as enhance movement resilience.

e. Lowering Costs and Barriers to Protest

There is evidence that the use of social media and Internet technologies in social movements may help lower costs and barriers to protest, which can lead to larger crowds and more diverse participants, to include encouraging the participation of women. The Internet serves in a “facilitating” capacity, making traditional forms of collective action easier to coordinate and lowering barriers to protest, as well as in a “creative” capacity, producing diversity through new tactics and information diffusion; however, the weak ties digital communications produce may also reduce the level of trust required among protest participants.⁹¹ The Egyptian Kefaya movement also applied the Internet as a low—risk means to mobilize support.⁹² Social media gives activists a means to notify a large audience of potential threats, violence, or repression, thereby allowing people to mobilize with more situational awareness. Additionally, the Internet and social media provides women with a means to support social movements both by staying informed and physically mobilizing, or in the case where women’s physical participation is restricted, social media provides women with a means to virtually support a campaign. As Radsch observes regarding female participation in the Libyan revolution, “Cyber activism enabled women to play a role in the revolution without going into the streets, translating

⁸⁸ Bennett, “Communicating Global Activism,” 151, 164.

⁸⁹ Dewey et al., “Impact of Social Media,” 32.

⁹⁰ Radsch, “Unveiling the Revolutionaries.”

⁹¹ Van Laer and Van Aelst, “Internet and Social Movement Repertoires,” 3, 15.

⁹² Stephan, *Civilian Jihad*, 208.

street activism by men into cyber activism by women.”⁹³ While social, familial, and cultural constraints may hamper female Internet use, women are using social media as a method to participate or gain information on social movements and consequently taking part in various forms of collective action, which subsequently influences the diversity and discourse of an organization.⁹⁴

f. Summary

Women are using social media as a means to participate in social movements, they engage in activist discourse and activities online, which adds diversity, shapes narratives, and brings innovation to social movements. The application of the Internet and social media as a communication tool can enhance many of the qualities necessary for successful social movements, including nonviolent collective action, increasing diversity and innovation, creating group narratives and identities, facilitating communication, and lowering barriers to protests. Additionally, women have played a role in these social movements through social media and use the Internet as a less restrictive space to participate in social movements. The repertoire women applied through social media thus far in support of social movements in the Middle East is largely supported through anecdotal evidence; however, the differential impact of women’s efforts has yet to be quantified.

C. METHODOLOGY

This thesis will evaluate the involvement of women on social media and their influence in the Arab Spring uprisings in Egypt in January 2011 and Yemen and Bahrain in February 2011. Each of these uprisings represents a nationalist social movement where activists employed social media to coordinate, communicate, and garner support for protests. Each uprising also represents a protest where female activists employed social media. I will be using statistical analysis, computer mapping, and secondary research to evaluate these events and women’s participation.

⁹³ Radsch, “Unveiling the Revolutionaries,” 17.

⁹⁴ Ibid.

These uprisings and associated social networks will be evaluated through Naval Postgraduate School Common Operational Research Environment (CORE) Lab methodologies, with a focus on the Twitter social media platform. The CORE Lab studies network—based organizations to analyze and identify the relationships between members of organizations and networks. *Twitter* is a “real time network” where people communicate through micro-blogs or messages known as *Tweets*.⁹⁵ The network enables people to publicly broadcast information, links, pictures, and videos with individuals, groups, or a wider community.⁹⁶ The network is *scale-free*,⁹⁷ a type of network where a small group of individuals have many connections to other actors and may even produce a significant portion of traffic while most of the individuals in the network have very few connections and produce very little.⁹⁸ In applying this concept to a Twitter network, most users produce very few Tweets directed to others, while a small group of individuals produce the majority of the Tweets. As Oliver and Marwell note, the effectiveness of this “critical mass” increases with group diversity.⁹⁹

The information I will be analyzing is publicly available and deliberately transmitted by users. Thus, the spread of this information and how people connect to each other may indicate which individuals and groups hold greater influence. In order for this data to be falsified, additional Tweets and Twitter users would need to be incorporated into the historical Twitter data samples I will be using. I will be using samples of Twitter data from individuals in Egypt, Yemen, and Bahrain to determine who is influential.

These samples will encompass a two-week period consisting of the day of peak protest in each country, as well as one week prior to and one week following that protest

⁹⁵ Twitter Website retrieved June 16, 2013, from <https://twitter.com/about>.

⁹⁶ Ibid.

⁹⁷ See Appendix.

⁹⁸ Sean F. Everton, *Disrupting Dark Networks*, Structural Analysis in the Social Sciences ; (New York: Cambridge University Press, 2012), 28; Joss Hands, @ *Is For Activism* (New York: Pluto Press, 2011), 119.

⁹⁹ Pamela Oliver, Gerald Marwell, and Ruy Teixeira, “A Theory of the Critical Mass. I. Interdependence, Group Heterogeneity, and the Production of Collective Action,” *American Journal of Sociology* 91, no 3 (1985), 524, <http://www.jstor.org/stable/2780201>.

date where data is available.¹⁰⁰ The data samples consist of Tweets from January 23 to February 6, 2011 from Egypt, Tweets from January 26 to February 10, 2011 from Yemen, and Tweets from February 7 until February 21, 2011 from Bahrain.¹⁰¹

The data set represents a one—time query from January 23 to February 22, 2011, filtered by first by protest-related *Hashtags*, or keywords marked with a “#” used to categorize messages and enable those interested in a topic to receive information, will be used to identify protest-specific Tweets.¹⁰² Following this, *geoinferencing* will be used to select only Tweets that originate Egypt, Bahrain, and Yemen.¹⁰³ The data will be further scrubbed to remove media, organizations, misidentified locations, and androgynous accounts. The resultant data set of Tweets from each country will be predominantly originated by users in the country, throughout a 14-day window that is relevant to each protest.

Using the refined data set, a pool of the most prevalent male and female Twitter users will be extracted based on their *total degree centrality*, or the total number of directional ties a user has connecting them to other users.¹⁰⁴ After identifying the subset of male and female users to analyze, social network analysis programs will be used to compare measures of centrality. *Centrality measures* are equations used to determine how centrally located and potentially influential, actors are within a social space.¹⁰⁵ The numerical centrality scores will be compared to identify differences between male and female users in connectedness, information brokerage potential, and other forms of influence. These numerical scores may provide an indication of the different levels of

¹⁰⁰ Data may not be historically available in cases where regime repression resulted in Internet blackouts or in cases where historical data may not be accessible due to technical issues.

¹⁰¹ See Appendix.

¹⁰² Twitter Website, retrieved June 16, 2013, from <https://support.twitter.com/entries/49309-what-are-hashtags-symbols#>

¹⁰³ *Geoinferencing* is a Topsy query functionality that provides an estimate of the user’s location based on geolocation information, profile content, language, and topics of interest. See Appendix for more details.

¹⁰⁴ Everton, *Dark Networks*, 399. See Appendix for more details. The total number of links includes one-way ties from the actor to other actors, and to the actor from other actors.

¹⁰⁵ Everton, *Dark Networks*, 12–13. See Appendix for centrality measures.

influence between men and women in the data sets, if differences exist. These scores may provide indicators as to whether women were influential during the Arab Spring protests. These scores may also indicate whether there is a difference in male and female influence online.

User activity will also be compared between the male and female Twitter users. These measures are provided within the data set and include the number of accounts a user follows, the number of accounts that follow a user, the number of Tweets sent out, the text of each Tweet, and the number of times a Tweet is *Retweeted*, or relayed by another user to their group of followers. This information may provide more details on the differences in communication strategies by men and women in these protest movements.

By assessing the Twitter data sets, this thesis may identify some of the differences in influence between men and women in the Middle Eastern online activist networks, what factors make female use of social media successful or unsuccessful, and whether there is a differential impact in women's use of social media in social movements.

D. CONCLUSION

Evidence indicates that women exercised some form of influence and were engaged in mobilization both on and offline during the Arab Spring uprisings. This thesis ascertains that women physically mobilized to participate in the Arab Spring protests in Egypt, Yemen, and Bahrain. In Egypt and Bahrain, women also mobilized virtually using social media. In Yemen women participated through traditional forms of social mobilization, in part, due to lack of access, infrastructure, and training on Internet Communications Technologies.

This thesis will demonstrate that online protest networks in Egypt and Bahrain indicate women did participate in virtual mobilization during the Arab Spring. In general, data indicates women communicate out to others more often than they received information from others. Furthermore, women in both countries followed more than double the number of accounts men followed, thus receiving information from more numerous, diverse sources. Women represented nearly fifty percent of the most

connected users Egyptian protest Twitter networks. Egyptian women directed communications to others more than twice as much as male users, whereas Egyptian men received communications from others more than three times as often. An assessment of Bahraini online protest activity reveals that women represented less than one-fourth of the most connected users. Women in Bahrain communicated out to others more often than men in Bahrain; however, in terms of total communications, they communicated less than their male counterparts. Taken as a whole, women in Egypt and Bahrain participated in online social mobilization during the Arab Spring, and this participation also contributed to the diversity of information and the communication within virtual protest networks.

The following chapters will discuss the how women can influence social mobilization, review case studies for Egypt, Bahrain, and Yemen, evaluate the available Twitter data sets, and provide a discussion of the results of that analysis. The next chapter will discuss women's influence on social mobilization in terms of nonviolence, diversity and innovation, collective identity, communication, and lowered barriers to protest. The third chapter will review each case study and discuss the events, relevant social movement concepts, the role of social media, and the role of women in the protests. The fourth chapter will provide analysis of each of the Twitter data sets, and this thesis will conclude with a discussion of the results of the data analysis.

II. GENDERED CONTRIBUTIONS TO SOCIAL MOVEMENT SUCCESS

A. INTRODUCTION: ARE WOMEN ORCHESTRATORS?

Social movements engage individuals and networks of people to mobilize, protest, and demand change. These networks rely on orchestrators to sustain, improve, and grow the network's membership, interactions, and productivity.¹⁰⁶ Orchestrators are people who act as entrepreneurs, advocates, mentors, and constant communicators within the network in order to lower costs of participation, establish the details of ideas and group identity, and develop personal relationships between individuals and groups.¹⁰⁷ Studies of interaction during negotiations and communications exercises reveal that each gender uses different communication skills and tactics; these differences may make women well suited to serve as orchestrators or choreographers within social movement networks.¹⁰⁸ The significant division between the male-dominated public sphere and the female-dominated private sphere in Middle Eastern society may also shape the ways women participate in and influence social movements. If women do have a differential impact on social movements and their organizations, then studying the contributions of women in the online networks supporting the Arab Spring protests may provide insight into their possible roles as network orchestrators.

While there are social movements that address women's issues, this thesis deals specifically with social movements in the Middle East where the demands are not gender-specific, for example, nationalist movements. In gender-specific mobilization, we would

¹⁰⁶ Anklam, *Net Work*, 137.

¹⁰⁷ *Ibid.*, 137.

¹⁰⁸ Mark A. Boyer, Brian Urlacher, Natalie Florea Hudson, Anat Niv-Solomon, Laura L. Janik, Michael J. Butler, Scott W. Brown, and Andri Ioannou, "Gender and Negotiation: Some Experimental Findings from an International Negotiation Simulation," *International Studies Quarterly* 53, no. 1 (2009): 40-41; Victor Savicki and Merle Kelley, "Computer Mediated Communication: Gender and Group Composition," *CyberPsychology & Behavior* 3, no. 5 (2000); Helen Fisher, *The First Sex: The Natural Talents of Women and How They Are Changing the World* (New York: Random House, 1999), 4-5; Linda Babcock and Sara Laschever, *Women Don't Ask: Negotiation and the Gender Divide* (Princeton, N.J.: Princeton University Press, 2003), 168.

expect one gender to play a more central role. The use of non-gender mobilization in this study compares male and female mobilization and thus can determine differences between the genders. Female participation in such social movements can shape and reinforce the factors that contribute to social movement success. In particular, women's participation in protests may encourage the use of nonviolent protest repertoires, which subsequently increases the potential for protest success.¹⁰⁹ Concurrently, the employment of a nonviolent repertoire creates opportunities for female participation. Women also contribute to the diversity and innovation of a protest movement through their participation and their influence in different spheres of life. Women's focus on building consensus and tactics in negotiation studies indicate that women may help shape inclusive group identities that also contribute to the success of a social movement.¹¹⁰ Thus, female communication skills may express collective identities in a less divisive way, leading to larger mobilizations and therefore creating more potential for success. Finally, the trust networks that women build, the cooperation skills women demonstrate, and the potential for gendered tactics to reduce repression serve to lower the barriers to participation.¹¹¹ This can bring marginalized groups into a protest movement, thereby adding to the mass, diversity, and resilience of a movement which ultimately can influence its success. With their preferences and tactics, women may shape the discourse and actions of a social movement to promote nonviolent, diverse repertoires and communicate inclusive collective identities that contribute to movement resilience and success.

¹⁰⁹ Asal et al., "Gender Ideologies;" Chenoweth and Stephan, *Why Civil Resistance Works*; Wendy Pearlman, *Violence, Nonviolence, and the Palestinian National Movement* (Cambridge, UK: Cambridge University Press, 2011).

¹¹⁰ Boyer et al., "Gender and Negotiation," 40; Tamra Pearson d'Estrée and Eileen F. Babbitt, "Women and the Art of Peacemaking: Data from Israeli-Palestinian Interactive Problem-Solving Workshops," *Political Psychology* 19, no. 1 (1998): 193.

¹¹¹ Aminzade and McAdam, "Emotions and Contentious Politics," 35; Ifat Maoz, "The Women and Peace Hypothesis? The Effect of Opponent Negotiators' Gender on the Evaluation of Compromise Solutions in the Israeli-Palestinian Conflict," *International Negotiation* 14, no. 3 (2009): 519, 531.

B. WOMEN'S MOBILIZATION AND NONVIOLENCE: PREFERENCES, PRACTICES, AND OUTCOMES

Women's participation in a social movement may influence the selection and execution of protest repertoires, since female preferences for non-violent, less costly protest can influence the level of violence. Nonviolent protest campaigns create less disruption in daily life, enable people to participate in the campaigns and continue to work or care for their families, and provide varied methods of participation.¹¹² Protest repertoires that enable women to fulfill family obligations also present less of a threat to the domestic status quo, which enables women in a patriarchal society to participate without creating objections or repercussions from male family members.¹¹³ Furthermore, the capacities of women to influence aspects of daily life facilitate the employment of a variety of non-violent protest tactics including boycotts and neighborhood—based initiatives, making a movement more resilient and less vulnerable to repression.¹¹⁴ In online social movement communities, evidence suggests women also participate in and orchestrate community dialogue.¹¹⁵

As women engage in social movement organizations, their participation in social movement debate and dialogue can shape decisions regarding repertoire selection, choices to employ non-violent tactics, and implementation of group choices. Gender studies on approaches to conflict and negotiation indicate that women approach the challenges by focusing on relationship building and collaborative negotiation styles. In general, studies show that when evaluating an issue or conducting negotiations, males focus on tasks and competition and females focus on relationships and the impacts of

¹¹² Chenoweth and Stephan, *Why Civil Resistance Works*, 38.

¹¹³ Sally Wade Maggard, "Gender Contested: Women's Participation in the Brookside Coal Strike," in *Women and Social Protest*, eds. Guida West and Rhoda Lois Blumberg (New York: Oxford University Press, 1991), 89–90.

¹¹⁴ Pearlman, *The Palestinian National Movement*, 195–196.

¹¹⁵ Radsch, "Unveiling the Revolutionaries," 14–18.; Manuel Castells, *Networks of Outrage and Hope* (Cambridge, UK: Polity Press, 2012), 70–71; L. Schleusener, "From Blog to Street: The Bahraini Public Sphere in Transition," *Arab Media and Society* 1, February 2007, 10–11, retrieved May 15, 2013, from http://www.arabmediasociety.com/countries/index.php?c_article=34.

goals on others.¹¹⁶ International negotiation studies also stress the preferences towards collaborative negotiation styles by women and conflictual negotiation styles by men.¹¹⁷ This is not to imply that women are less competitive, but whereas men use the context of goals to develop strategies, women view their strategies in terms of creating and sustaining relationships.¹¹⁸ It is possible that the combination of both task—oriented and relationship—oriented approaches to discourse in a social movement can influence repertoire selection among members of a protest movement instead of only a single dominant approach. My research indicates that the involvement of women in selecting and executing a protest repertoire may result in the consideration of a wider range of tasks, goals, and potential outcomes to include nonviolent repertoire choices.

Along with the differences in female approaches to debate and negotiations, perceptions of female intentions may also influence the discourse and selection of protest repertoires. Research on a connection between women and peace in the context of the Arab Israeli conflict concludes that women are stereotypically portrayed as more peace—oriented than men, (thus more credible regarding peace) and suggests that this may give women an advantage in their ability to promote and elicit support for peace proposals during negotiations.¹¹⁹ Additionally, women were more willing to participate in negotiations and presented positive attitudes towards peace encounters for longer periods of time than men in the study group.¹²⁰ Women's positive approach towards peace negotiations and their ability to elicit support are viewed in other studies as part of a "Gendered Evaluation Effect," whereby the stereotypes of women as more peaceful changed opponents' perceptions of compromises and negotiations; studies showed that

¹¹⁶ d'Estrée and Babbitt, "Women and the Art of Peacemaking: Data from Israeli-Palestinian Interactive Problem-Solving Workshops." 191. Pearson d'Estree synthesizes research from Brown, 1975; Keashey, 1994; Renwick, 1977; Babcock and Laschever, *Women Don't Ask*, 169; d'Estrée and Babbitt, "Women and the Art of Peacemaking: Data from Israeli-Palestinian Interactive Problem-Solving Workshops", 205.

¹¹⁷ Boyer et al., "Gender and Negotiation," 40.

¹¹⁸ d'Estrée and Babbitt, "Women and the Art of Peacemaking," 193; Maoz, "Women and Peace Hypothesis," 521.

¹¹⁹ Maoz, "Women and Peace Hypothesis," 520. Maoz synthesizes research from Togeby, "The Gender Gap in Foreign Policy Attitudes," 1994, and Hunt and Posa, "Women Waging Peace," 2001.

¹²⁰ Yaacov B. Yablon, "Gender Differences," 308.

female compromises were viewed more favorably, female negotiators were viewed as more trustworthy, and female participation in peace negotiations can positively influence the outcome.¹²¹ As women engage in social movements, their disposition to collaborate more than their male counterparts in negotiations and their ability to elicit support for ideas may contribute to the selection and execution of a nonviolent protest repertoire.

The use of nonviolent protest repertoires can encourage women's participation because there are fewer challenges to the "moral, physical, informational, or commitment" issues of the participants, and women's participation can also shape the contributions of other group members.¹²² Research indicates that women define themselves by their relationships more frequently than men, subsequently their behavior during group interaction focuses more on building and enhancing relationships.¹²³ Other research findings noted that female groups employed emotions and personal testimony, as well as placed greater emphasis on responsibilities within the group.¹²⁴ These traits may enable women to propose ideas and protest tactics that better address long-term strategies.

As groups determine movement strategies, female contributions may encourage a more inclusive and holistic consideration of a wider array of repertoire ideas. Women's participation in a group dialogue may encourage participation by other group members and set a tone of discourse and collaboration. Studies indicate that men contribute and cooperate more in groups where the groups are predominantly women, as opposed to all male or predominantly male.¹²⁵ Women employ dialogue over debate or argument more frequently as a means to assess goals, which provides a less fixed, more flexible method

¹²¹ Maoz, "Women and Peace Hypothesis," 519. 531 See Maoz for a synthesis of research.; d'Estrée and Babbitt, "Women and the Art of Peacemaking," 205–206.

¹²² Chenoweth and Stephan, *Why Civil Resistance Works*, 10.

¹²³ Boyer et al., "Gender and Negotiation," 27; d'Estrée and Babbitt, "Women and the Art of Peacemaking," 203–204.

¹²⁴ d'Estrée and Babbitt, "Women and the Art of Peacemaking," 200.

¹²⁵ Boyer et al., "Gender and Negotiation," 28. Boyer synthesizes research findings by Sell (1997).

to discuss challenging issues.¹²⁶ Not only can women influence the dynamics of repertoire selection, but their involvement can also encourage contributions by other group members.

Women's preferences for nonviolence and collaboration as well as their emphasis on collective responsibilities and relationships can shape elements of a protest repertoire, encourage wider participation and support, and contribute to the success of the movement. As Chenoweth and Stephen note, the greater level of participation in nonviolent social movements increases potential for mass participation and ultimately, improves the chances of success in a protest movement.¹²⁷ As civil society gains territory in cyberspace, women who seek to organize or gain influence will likely do so as well. Should female preferences for nonviolence, collaboration, relationship building, and dialogue migrate into these online forums, it is possible that women will continue to shape protest movements in the virtual world, and that influence will have effects on the movement itself, the virtual debate, and physical mobilization.

C. DIVERSITY, INNOVATION, AND WOMEN'S CONTRIBUTIONS

Participation in social movements by both genders can create more resilient movement structures, produce more effective protest repertoires, and enable a movement to exert influence across a wider spectrum of daily life. Female employment of contextual thinking and inclusive dialogue has the potential to identify and discuss a more diverse range of protest tactics.¹²⁸ Research has determined that women's previous mobilization strategies employed various models of organization. Women's marginalized status in society was a factor driving innovation, key to a dynamic social movement.¹²⁹ The

¹²⁶ Ibid., 28. Boyer synthesizes Kolb and Coolidge (1991) research.

¹²⁷ Chenoweth and Stephan, *Why Civil Resistance Works*, 39.

¹²⁸ Fisher, *The First Sex*, 4–5, 11.

¹²⁹ Elisabeth S. Clemens, "Organizational Repertoires and Institutional Change: Women's Groups and the Transformation of U.S. Politics, 1890-1920," *American Journal of Sociology* 98, no. 4 (1993): 758.

contextual thinking, inclusive dialogue, and mobilization strategies of women transfer into online communities, contributing to diversity and innovation in social mobilization online.

The different strategies men and women use to address problems and discuss solutions may contribute to a more diverse protest repertoire. These disparate strategies may also help produce innovative solutions to the challenges a social movement faces. As previously noted, men and women approach problems in different ways. Women tend to think more contextually compared to men, and this “web-thinking” enables women to connect more details, identify more options, and provide more points of view.¹³⁰ This contextual thinking, along with the diversity in skills, life experiences, and perspectives women bring to a social group adds diversity. In the oft gender-segregated societies of Middle Eastern countries, the inclusion of women in an organization may not only add diversity, but also provide a movement with access to a different set of skills, talents, and social networks than it would otherwise have. Women’s participation in a social movement adds diversity, which increases the capacity for a movement to survive setbacks, creates new opportunities for innovation, and improves the capacity for a movement to disrupt civic life.¹³¹ Studies show that gender affects the substance of social and political interactions between people; Boyer notes, “Diversity in gender will thus bring with it diversity in viewpoints, and diversity in the way we consider the issues at hand.”¹³²

Furthermore, the structure of the organization can also be influenced by the inclusion of women. Women in many countries in the Middle East are marginalized or excluded from political structures, which subsequently encourages them to develop alternative models of organization.¹³³ These alternative models of organization can be based on diverse forms of social organizations within society, a technique employed by

¹³⁰ Fisher, *The First Sex*, 4–5, 11.

¹³¹ Chenoweth and Stephen, *Why Civil Resistance Works*, 10.

¹³² Boyer et al., “Gender and Negotiation,” 43.

¹³³ Clemens, “Organizational Repertoires and Institutional Change,” 755.

the U.S. women's movement in the early twentieth century.¹³⁴ These diverse forms of organization also provide influence in a wider spectrum of institutions in society. As women mobilize, they provide access into these different segments of society. This organization and access can contribute to the resilience of a protest movement as well as the level of support it can amass.

The diversity and skills that women contribute to social movements may also apply when social movements use online communication strategies. Studies of computer mediated communication reveal that there are differences between male-only, female-only, and mixed-gender groups in terms of language choice, messaging patterns, and satisfaction with the computer-based interaction.¹³⁵ While men used rougher language, and addressed the group collectively, women used more personal language, and engaged in more directed conversations; mixed gender group communication fell in between the single gender groups.¹³⁶ Studies also indicate that individual communication styles changed depending on the group composition, with discussion groups adapting to the interaction patterns of the dominant gender within the group.¹³⁷ Research shows that the gender composition of computer-based groups matters, shaping the interaction within the group, the satisfaction of the participations, and the timeliness of decisions.¹³⁸ These studies indicate that gender can influence discourse in online communities and social movement organizations. If gender affects the diversity and innovation of a social movement, and group composition affects online discourse, it is likely that the diversity and innovation women contribute carries into social mobilization online.

¹³⁴ Ibid., 758.

¹³⁵ Savicki and Kelley, "Computer Mediated Communication," 817.

¹³⁶ Ibid., Savicki synthesizes Herring, "Gender Differences in Computer Mediated Communication: Bringing Familiar Baggage to A New Frontier," (1994).

¹³⁷ Ibid., 818 as referenced., 819.

¹³⁸ Ibid., 821.

D. GENDER AND THE CREATION OF GROUP IDENTITIES

The creation of group identities requires establishing a unified set of values and meanings associated with a group narrative, essentially building consensus within a group.¹³⁹ The more inclusive and resonant a collective identity is, the more support it may elicit internally, externally, and from potential movement recruits. Women focus on maintaining relationships and creating win-win scenarios, which can help create an inclusive group identity. Thus, women's participation in social movements may add different dimensions to the dialogue that shapes the group identity compared to a movement dominated by a single gender. Furthermore, the strengths women contribute towards a group can influence group identity as it develops and evolves in online forums.

Female emphasis on relationship building, negotiation, and discourse can help blend disparate sets of values into a single group identity.¹⁴⁰ Research shows that while both genders can predict strategies for negotiation, women are often better at understanding verbal and non-verbal cues as well as understanding others' points of view.¹⁴¹ This strength may help mixed-gendered groups navigate contentious issues and produce group identities that are inclusive and more readily accepted by members of the group.

Female emphasis on relationship building may enable women in groups to effect collective values and concerns in order to address a wider array of issues and create a more inclusive group identity.¹⁴² These skills can have a positive effect on a social movement. As d'Estree and Babbitt note in their study people who build relationships in this manner:

[They] develop networks that reach into groups with whom they need to form political coalitions to gain influence. They are more likely to have access to less distorted information about the other party's needs and

¹³⁹ Della Porta and Diani, *Social Movements*, 113.

¹⁴⁰ Ibid., 113.

¹⁴¹ d'Estrée and Babbitt, "Women and the Art of Peacemaking," 194.

¹⁴² Ibid., 189–190.

intended actions; hence, they may also have invaluable opportunities to validate or invalidate political operating assumptions.¹⁴³

Research also indicates that women in leadership positions are more frequently concerned with the welfare of those they work with and keeping constructive relationships with them.¹⁴⁴ Women's participation can provide social movement groups with an increased capacity to foster relationships, create a unified set of values, and address a wider range of contentious issues. Thus, women's participation can contribute to the establishment of a cohesive group identity that resonates with a more diverse population and garners more support.

Digital networks can also reinforce group identities through the creation of narratives, and when women are involved in online networks, they can contribute to this process.¹⁴⁵ As interactive media participation encourages activity, and that activity for one member constitutes participation for another, the participation of a diverse group of people can shape group identity through these interactions.¹⁴⁶ If women are engaged in online discourse, it is possible that their predisposition for relationship building, their ability to empathize and see different viewpoints, and their preferences for win-win solutions in conflict are reflected online.¹⁴⁷ In an online environment dominated by communication and language choice, the ability to engender support and gain the empathy of others may contribute to the successful establishment of a group identity. Further studies note that women demonstrate more personal, moderate, and supportive language whereas men used more commanding, less moderate language.¹⁴⁸ Women may employ more moderated language and debate when they engage in social movements, which may contribute to the successful development and maintenance of collective

¹⁴³ Ibid., 189.

¹⁴⁴ Babcock and Laschever, *Women Don't Ask*, 177.

¹⁴⁵ Bennett, "Communicating Global Activism," 146–150.

¹⁴⁶ Markus, "Toward a 'Critical Mass'," 505.

¹⁴⁷ Boyer et al., "Gender and Negotiation," 29.

¹⁴⁸ Ibid., 818 as referenced.; d'Estrée and Babbitt, "Women and the Art of Peacemaking," 200.

identity. When women participate in social movement discourse through social media, they the potential exists for them to add to the narrative, represent a diverse audience, and help frame collective identity.

E. COMMUNICATION AND GENDER

Communication enables movement organizations to disseminate their repertoires, control group narratives and identities, and organize and plan protest events. Research shows that men and women communicate differently. The combination of these different communication skills and methods may enhance the means of communicating repertoires, identities, and plans for collective action. While communication is a critical element to the success of social movements, effective communication is central for movements that employ online social media resources. If each gender has different strengths in communication that resonate with a wide spectrum of individuals, then incorporating women into a social movement strengthens the communication potential of the movement.

Taken as a whole, research on gender differences identifies that men and women communicate in gender-specific ways that can shape collective discourse. Critical skills when communicating in groups and negotiating repertoires, identities, and determining collective action include self-disclosure, empathy, and superior communication skills.¹⁴⁹ Other essential skills include the ability to identify solutions that benefit all and ensure group interaction respects everyone and facilitates contributions by everyone.¹⁵⁰ Women also practice dialogue more than debate and argument, which may enable factions within a group to build connections and negotiate as opposed to merely maximizing their interests.¹⁵¹ Incorporating women into group conversation may facilitate a more inclusive dialogue, consolidate the messages of a group, and communicate it to a wider audience.

¹⁴⁹ “Women and the Art of Peacemaking,” 188.

¹⁵⁰ *Ibid.*, 188.

¹⁵¹ Boyer et al., “Gender and Negotiation,” 28.

When women participate in social movements, their communication strengths play out when negotiating and gaining influence across different groups. Research shows that whereas men focus on positions during negotiations, women focus on relationships to determine what each faction's goals are and address them more effectively.¹⁵² Women also develop networks and facilitate access into the organizations that they need to form coalitions.¹⁵³ When women engage in social movements, research indicates that gender will affect social and political interactions and may influence interactions within groups and this may give women access to different or additional information.¹⁵⁴ The incorporation of women in social movement discourse can contribute to building the relationships necessary for resilient activist networks.

While social movements can benefit from the incorporation of women, the Internet offers women opportunities to capitalize on their communications strengths and share their opinions and experiences. It must be noted, however, that in the absence of non-verbal cues from face-to-face communication, women may find themselves at a disadvantage.¹⁵⁵ Savicki hypothesizes, however, that women make up for the lack of visual cues from face-to-face communication by using language patterns and language choice.¹⁵⁶ Boyer cites that a higher volume of messages were sent out in all-female or mixed gender groups, and notes that women's incorporation into a decision-making process may influence the behavior of the group and drive more interaction within the group.¹⁵⁷ In general, these studies indicate that women continue to send out more messages within a group and communicate more frequently. This behavior ensures that

¹⁵² Babcock and Laschever, *Women Don't Ask*, 168.

¹⁵³ d'Estrée and Babbitt, "Women and the Art of Peacemaking," 189.

¹⁵⁴ Boyer et al., "Gender and Negotiation," 43.

¹⁵⁵ Lillemor Adrianson, "Gender and Computer-Mediated Communication: Group Processes in Problem Solving," *Computers in Human Behavior* 17, no. 1 (2001): 71. Studies show that women produce more messages in face-to-face interaction than computer mediated interaction, share more opinions, and agree with others more often.

¹⁵⁶ Savicki and Kelley, "Computer Mediated Communication," 824.

¹⁵⁷ Boyer et al., "Gender and Negotiation," 37.

communication continues between members of an organization, thus keeping dialogue over movement repertoires, objectives, and actions in motion.

F. LOWERED COSTS AND BARRIERS TO PROTEST

The differences in male and female preferences for violence, negotiation strategies, and communication skills affects the development of trust networks that are essential to establishing cooperation and lowering costs of protest. My research indicates that when women engage in negotiations and group discussion, they can engender trust. Furthermore, studies of computer mediated communications show that not only does technology empower weaker groups, but also it may influence group cooperation. Studies show that women can positively influence contentious negotiations, that female compromises are viewed more favorably, and that female negotiators are viewed as more trustworthy.¹⁵⁸ If the participation of women during group interactions contributes to the development of stronger trust networks among movement participants, then these trust networks may contribute to lowering barriers to protest.

If women are seen as more trustworthy, men within the group may be more willing to compromise during discourse or share resources during interaction. Studies showed that members of a more powerful group are more willing to share scarce resources with subordinate groups who are viewed as cooperative and trustworthy.¹⁵⁹ Additional studies of group interaction found that there were few differences between women's contributions to groups that were only women or predominantly male, but instead they found that men contributed more towards cooperating when interacting in groups that were predominantly female.¹⁶⁰ Additionally, the incorporation of women into protest activity may signal to regime forces that a group presents less of a threat, thus, female participation in social movement groups may also lower barriers to protest by

¹⁵⁸ Maoz, "Women and Peace Hypothesis," 519, 531.

¹⁵⁹ Ibid., 533., as synthesized by Maoz from Rosenberg and Wolfsfeld 1977.

¹⁶⁰ Boyer et al., "Gender and Negotiation," 28.

increasing the capacity of a group to evade repression.¹⁶¹ These networks and this cooperation stand to create a higher level of trust and lower barriers to protest.

While incorporating women into social movements can build trust networks and lower barriers to protest, the incorporation of women into online social movement communities may have a similar effect. The inclusion of women in social movements and organizations can increase the strength of trust networks and collaboration, studies of computer mediated communication stand to empower both stronger and weaker parties and create more win-win situations, thus enhancing trust networks and giving weaker parties a potentially stronger voice in group interaction.¹⁶² Online social networks provide women with the capacity to support social movements both physically and virtually, enabling participation by women when it would otherwise be prohibitive.¹⁶³ Thus, the capacity for women to create and sustain trust networks may contribute to lowering barriers to protest.

G. CONCLUSION

Social movements that employ online social networks as part of their organization require individuals to serve as orchestrators who can communicate ideas, create relationships, and lower the costs of participation.¹⁶⁴ I argue that women, given their abilities and influence on group dynamics can serve as these network orchestrators in online social movement communities in the Middle East and contribute to the success of a social movement. Female negotiation and communication skills are essential in the unification of group messages and the coordination between various sub-groups of a movement. Women's preferences for nonviolence and their negotiating strengths may encourage the employment of a nonviolent protest repertoire. The inclusion of women in a social movement contributes to the diversity of movement participants, which is also a

¹⁶¹ Aminzade and McAdam, "Emotions and Contentious Politics," 35.

¹⁶² Boyer et al., "Gender and Negotiation," 29.

¹⁶³ Radsch, "Unveiling the Revolutionaries," 17.

¹⁶⁴ Anklam, *Net Work*, 137.

key element in successful protest movements.¹⁶⁵ Furthermore, female differences and strengths in communication also may contribute to the effective creation and communication of a more unified group identity, further contributing to group success. Finally, the participation of women in a social movement may not only help achieve consensus and unify a group but may also lower the barriers to protest. By communicating the group message, women can fill a vital role as orchestrators in creating the unity, numbers, and trust networks required for the execution of widespread activism that can contribute to the success of a social movement.

¹⁶⁵ Stephan and Chenoweth, "Why Civil Resistance Works," 39-40.

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III. INTRODUCTION TO THE CASE STUDIES

In January 2011, the Arab Spring protests swept through the Middle East, starting with Tunisia's ouster of President Zine el Abidine Ben Ali and thus signaling to opposition movements in other Arab countries that dramatic change was possible. Arab leaders maintained a watchful eye on the rising tide of protests in neighboring countries, simultaneously seeking to shore up domestic support and quell opposition forces in their own territories. These nationalist movements thrived on the streets and in the virtual world, with women playing a visible role in many of these Arab Spring protests. The uprisings in Egypt, Yemen, and Bahrain centered on old, long-standing grievances, employing new social media tools to help mobilize people and gain support. The movements in Egypt, Yemen, and Bahrain differ in their national histories, social structures, mobilization opportunities, and grievances, yet each movement saw women take to the streets and to the Internet to participate in the uprisings. A few key points common to all three case studies, elucidated in the studies below are

- Though traditional, grass roots mobilization was crucial to protests in each country, social media provided a new way to organize, mobilize, and report on the protests.
- Women who participated in protests engaged and mobilized their own unique social networks and communicated to their associates, this provided opposition forces access to larger audience and more diverse knowledge and skills.
- The capacity to employ social media in protest varies by society. In Egypt and Bahrain, women employed social media to participate in protest activity, whereas in Yemen, traditional methods of mobilization were more effective.

In this chapter I first review the background of the three case studies, then discuss the employment of social media during each protest, women's participation in each protest, and conclude with female contributions to the protests.

A. EGYPT

We want to go down to Tahrir Square on January 25. If we still have honor and want to live with dignity on this land, we have to go down on January 25. We'll go down and demand our rights, our fundamental human rights... If you think yourself a man, come with me on January 25th [Emphasis added].¹⁶⁶

Asmaa Mahfouz's demand for dignity in her video blog resonated with the protesters that gathered in Tahrir Square in Cairo two days later in January 2011. The crowds throughout Egypt demanded "Bread, Freedom, and Social Justice," and were exhausted from decades of a declining economy, rising unemployment, and heavy-handed government repression.¹⁶⁷ As protests slowly escalated in size and numbers, the June 6, 2010 death of Egyptian blogger Khaled Said symbolized the inability of the Egyptian government to protect its people, the corruption of the security forces, and created a profound sense of injustice among the well-connected technology-savvy Egyptian youth.¹⁶⁸

The elections of November 2010, widely viewed as fraudulent, convinced many of the need for political change creating another domestic opportunity for mobilization.¹⁶⁹ Opposition parties spread word of the fraudulent electoral practices among their networks of activists.¹⁷⁰ With the opposition groups engaged, protests ongoing, and grievances mounting, domestic opportunities for protest were rife.

As tension in Egypt mounted, Mohammed Bouazizi set himself on fire in Tunisia in protest, igniting the Jasmine Revolution. Tunisia's success in ousting President Zine el-Abidine Ben Ali in January 2011, combined with a lack of interference by Western

¹⁶⁶ Asmaa Mahfouz video blog transcript quoted in Radsch, "Unveiling the Revolutionaries," 3.

¹⁶⁷ Castells, *Networks of Outrage and Hope*, 53–56, 66, 247–252; International Crisis Group, "Popular Protest in North Africa & the Middle East (I): Egypt Victorious?," *Middle East/North Africa Report*, no. 101 (2011), i–3.

¹⁶⁸ International Crisis Group, "Popular Protest in North Africa & the Middle East (I): Egypt Victorious?," *Middle East/North Africa Report*, no. 101 (2011), 1, also in footnote 4.

¹⁶⁹ *Ibid.*, i.

¹⁷⁰ Wael Ghonim, *Revolution 2.0: The Power of the People Is Greater Than the People in Power: A Memoir* (Boston: Houghton Mifflin Harcourt, 2012), 119–120.

powers in the rising tide of protests, created international opportunities that convinced the Egyptian people a revolution could work.¹⁷¹ Tunisia's success was the spark for Egypt's revolution.¹⁷² Activists began to advertise January 25, 2011 as the "Day of Revolt" and spread the word through various online and offline social networks.¹⁷³

January 25, 2011 signaled the beginning of 18 days of protest throughout Egypt, paralyzing major cities, damaging the economy, and chipping away at the government's legitimacy. The majority of these protests were nonviolent, with thousands of Egyptians gathering in Tahrir square.¹⁷⁴ Recognizing the opposition's use of social media, the Egyptian government blocked Twitter and Facebook on January 26; two days later all Internet and mobile phone services were suspended. On February 1, as Tahrir Square swelled with anywhere from 200,000 to two million protesters, President Mubarak offered a concession of not running for reelection, which was promptly ignored.¹⁷⁵ The following day, security forces tried to clear Tahrir Square by force and failed.¹⁷⁶ The hard fought victory made Tahrir Square symbolic site of protest and indicated the potential for victory among the protestors. By February 10, President Mubarak announced that he was giving more power to the vice president, and a day later, the President resigned.¹⁷⁷ On February 12, protestors cleaned up Tahrir Square, and by March 19, a constitutional referendum was held.¹⁷⁸

The uprisings in Egypt, while considered successful in achieving a power transition, were only the beginning of unrest and contentious collective action. By March 23, the government outlawed strikes and protests, and by April 1, protestors were back in

¹⁷¹ International Crisis Group, "Egypt Victorious?," i

¹⁷² Ibid.

¹⁷³ Timeline synthesized from Castells, *Networks of Outrage and Hope*, 53–56, 247–252; International Crisis Group, "Egypt Victorious?," i–3.

¹⁷⁴ International Crisis Group, "Egypt Victorious?," 3.

¹⁷⁵ Castells, *Networks of Outrage and Hope*, 53–56, 247–252; International Crisis Group, "Egypt Victorious?," i–3.

¹⁷⁶ Ibid.

¹⁷⁷ Ibid.

¹⁷⁸ Ibid.

Tahrir. Protests continued in response to the new government and armed forces throughout the rest of 2011. These protests not only demonstrated to the Egyptian people that change was possible, they also cemented new tactics for the employment of social media and new roles for women within the protests.

B. YEMEN

*On 14 April, President Saleh declared that Islam forbids men and women mixing in public places and called on women to 'return home.' The next day, across the country, thousands of women took to the streets to affirm their rights to peaceful assembly and to participate in public life. [Emphasis added]*¹⁷⁹

Much like the Egyptians, the Yemeni people faced mounting economic challenges, political exclusion, and regime repression. In the two decades preceding the 2011 revolution, Yemen faced increasing challenges from the Huthi rebellion in North Yemen, the secessionist movement in southern Yemen, terrorist threats from Al-Qaeda, and internal political unrest connected to electoral and legislative reforms.¹⁸⁰ At the time of the protests Yemen was plagued with extensive poverty: around 43 percent of the Yemeni population was below the poverty line and unemployment was approximately 35 percent, with nearly half of all 18 to 28 year olds unemployed.¹⁸¹ While Yemen had a comparatively open political system, President Saleh maintained his hold on power through an intricate series of patronage networks along both tribal and geographical lines.¹⁸² Grievances with the lack of political opportunities grew when the Yemeni Parliament's leading party expressed plans to remove restrictions on term limits for the president, Ali Abdullah Saleh, enabling him to remain in office indefinitely.¹⁸³ Adding to these profound economic and political grievances, extensive violent repression from

¹⁷⁹ International Federation for Human Rights, "Women and the Arab Spring: Taking Their Place?," International Federation for Human Rights 2012, 39–40, retrieved July 9, 2013, from http://arabwomenspring.fidh.net/index.php?title=Main_Page.

¹⁸⁰ International Crisis Group, "Popular Protest in North Africa & the Middle East (II): Yemen between Reform and Revolution," *Middle East/North Africa Report*, no. 102 (2011): i.

¹⁸¹ *Ibid.*, 10.

¹⁸² *Ibid.*, 10.

¹⁸³ *Ibid.*, 1 .

regime security forces and regime-hired thugs demonstrated to opposition parties that the regime could not protect their rights to protest peacefully, thus deepening the sense of injustice among Yemeni citizens.¹⁸⁴

While discontent and opposition to the Saleh regime grew, patronage networks, tribal loyalties, and Islamist agendas all hampered the creation of a unified opposition. The Joint Meeting Parties (JMP) or Common Forum incorporated five parties, including the Islamist Islah party and the southern Yemeni Socialist party.¹⁸⁵ Given Saleh's "divide and conquer" strategy to gain tribal loyalties and maintain patronage networks, and the lack of a legitimate political challenger, the JMP was the organized opposition party as the protests began.¹⁸⁶ Student activists, however, were first to organize, mobilize, and protest with the JMP following.¹⁸⁷ Initially, opposition demands focused on the more political opportunities, less corruption, as well as political transparency and accountability.¹⁸⁸ These demands expanded as Yemenis saw the success of opposition forces in other Arab countries and began to imagine their own successful revolution. "Irhal" or "Go" became a slogan in major cities such as Taiz, representing the youth opposition's demand to see President Saleh ousted.¹⁸⁹

On January 20, 2011, three major rallies took place in Sana'a, Taiz, and Al-Baydah demanding the reengagement of national dialogue, the return of presidential term limits, and protesting poor living conditions.¹⁹⁰ Three days later, before the Egyptian revolution began en masse, a new wave of protests against President Saleh began.¹⁹¹ As

¹⁸⁴ Ibid., 6.

¹⁸⁵ Ibid., 2.

¹⁸⁶ Ibid., i.

¹⁸⁷ Stacey Philbrick Yadav, "Countries in Crisis 2012: Yemen," Freedomhouse Report (2012): 2, retrieved July 9, 2013, from <http://www.freedomhouse.org/report/countries-crossroads/2012/yemen-0>.

¹⁸⁸ Stacy Philbrick Yadav, "No Pink Slip for Salih," *Middle East Research and Information Project* (2011), retrieved June 23, 2013, from <http://www.merip.org/mero/mero020911>.

¹⁸⁹ Marc Lynch, *The Arab Uprising: The Unfinished Revolutions of the New Middle East* (New York: Public Affairs, 2013), 106.

¹⁹⁰ International Crisis Group, "Yemen between Reform and Revolution," 2.

¹⁹¹ Castells, *Networks of Outrage and Hope*, 253.

Cairo's Tahrir Square filled with people, the rallies in Sana'a also mobilized thousands of demonstrators.¹⁹² On February 2, recognizing the emerging threat of these protests, President Saleh offered concessions to opposition forces that included resuming the national dialogue, increased voting rights for youth, and to redact his pursuit of a second term and reinstate term limits.¹⁹³ These concessions were viewed with suspicion by opposition forces and ultimately refused.¹⁹⁴

As Egypt's president fell, demonstrations grew to tens of thousands of people in eight cities in Yemen following Friday prayers on February 18. President Saleh relied heavily on support from tribes and Islamists to secure his power and attempted to retain their support and the support of Islamist scholars through meetings, patronage networks, and exacerbating social divisions.¹⁹⁵ Saleh's tenuous power base held strong and political opposition parties, tribal leaders, and religious leadership shied away from the protests until mid-February when the numbers of protestors swelled and regime repression became violent.¹⁹⁶ On February 23, members of parliament began to defect and days later, anti-regime demonstrations swelled to record numbers.¹⁹⁷ Tens of thousands gathered in Sana'a at the renamed "Change Square" to demand immediate regime change, and protests in Aden and Taiz were even larger. Activists from civil society and youth from student organizations led many of these protests.¹⁹⁸ Reporting on the protests in Change Square in Sana'a estimate the protesters comprised about 50 percent tribesmen, 40 percent students, 10percent Huthis and others.¹⁹⁹ By late February 2011, anti-regime protests became a fixture in cities throughout Yemen.

¹⁹² International Crisis Group, "Yemen between Reform and Revolution," 2.

¹⁹³ *Ibid.*, 8.

¹⁹⁴ *Ibid.*, 3.

¹⁹⁵ *Ibid.*, 9.

¹⁹⁶ *Ibid.*, i.

¹⁹⁷ *Ibid.*, 3.

¹⁹⁸ *Ibid.*, 3-4.

¹⁹⁹ *Ibid.*, 4.

With Saleh's hold on power threatened, the Gulf Cooperation Council (GCC) countries began to withdraw support, giving opposition forces an international opportunity to continue their demonstrations.²⁰⁰ As opposition grew in size and violence, the GCC countries provided President Saleh with proposal for his departure from power, which he rejected.²⁰¹ President Saleh's dogged hold on power was disrupted on June 3, 2011 when Saleh sought medical treatment in Saudi Arabia after an assassination attempt.²⁰² He remained in Saudi Arabia after his release from the hospital on August 7.²⁰³ Six weeks later, President Saleh returned to Yemen, which prompted a rise in protest violence resulting in hundreds of deaths.²⁰⁴ As protests continued, Saudi Arabia negotiated an agreement to guarantee Saleh's resignation in November 2011.²⁰⁵

Finally, President Saleh, in exchange for immunity, agreed to leave office on November 23, 2011.²⁰⁶ Yemen's protesters finally accomplished one of their goals. Following Saleh's departure, the Vice President al-Hadi assumed the presidency, and the National Reconciliation Government began charting Yemen's path forward.²⁰⁷

C. BAHRAIN

My father, Ebrahim Sharif, of the National Democratic Action Society, had been arrested in the middle of the night. I ask her [my mother] to tell me exactly what happened as I whip out my laptop and start typing her

²⁰⁰ Silvia Colombo, "The GCC Countries and the Arab Spring, between Outreach, Patronage and Repression," Instituto Affari Internazionali (IAI) Working Papers (2012), 9, retrieved June 23, 2013, from <http://www.iai.it/pdf/DocIAI/iaiw1209.pdf>.

²⁰¹ Ibid.

²⁰² Lynch, *The Arab Uprising*, 156.

²⁰³ Ibid, 156.

²⁰⁴ Castells, *Networks of Outrage and Hope*, 257.

²⁰⁵ Colombo, "The GCC Countries and the Arab Spring," 9.

²⁰⁶ Castells, *Networks of Outrage and Hope*, 258.

²⁰⁷ Yadav, "Countries in Crisis 2012: Yemen," 3–4.

account of the arrest in English to post it on my Twitter account. Back then I had about 150 followers. It jumped to over 1,000 in just a few days [Emphasis added].²⁰⁸

While Bahrain's opposition forces were inspired by events in Tunisia and Egypt, the Bahraini revolution was far from successful. Unlike Egypt and Yemen before the Arab Spring, Bahraini citizens enjoyed a relatively prosperous economy, considerable access to modern communications infrastructure, and a moderately open society.²⁰⁹ The predominant source of grievances among the Bahraini opposition groups focused on the discrimination of the majority—Shiite population by the Sunni al-Khalifa regime, the lack of opportunities for political participation for everyone outside the regime, and severe regime repression and human rights violations.²¹⁰ Longstanding Shiite discrimination produced a strong sense of injustice due to inequitable opportunities for political participation and employment.²¹¹ The longstanding grievances over promised political reform were a decade in the making. A year after Bahrainis overwhelmingly approved a referendum, Bahrain's emir singularly promoted a revised constitution that both ensured the regime's primacy and neglected opposition parties' concerns.²¹²

Following events in Tunisia, Egypt, and Yemen, Bahrain's opposition parties called for protests on February 14, 2011 in Manama.²¹³ Over the next four days, after violent regime repression employing tear gas and live ammunition, protesters took control of Pearl Square and 18 Shiite opposition leaders from the al-Wifaq party resigned from parliament in protest.²¹⁴ During this time, the protests grew as Shiite leaders called

²⁰⁸ Yara Ebrahim al Sayed, "Testimonies from Bahrain: My Father, the Activist | Amnesty's Global Human Rights Blog," retrieved August 2, 2013, from <http://livewire.amnesty.org/2011/09/26/bahrain-testimonies-my-father-the-activist/>.

²⁰⁹ International Crisis Group, "Popular Protest in North Africa & the Middle East (III): The Bahrain Revolt," *Middle East/North Africa Report*, no. 105 (2011): i.

²¹⁰ *Ibid.*, i.

²¹¹ *Ibid.*, 4–5.

²¹² *Ibid.*, 3.

²¹³ *Ibid.*, 6.

²¹⁴ *Ibid.*

for their constituents to support the “14 February Movement.”²¹⁵ The brutal use of force by Bahraini forces further outraged and mobilized even more of the population.²¹⁶ At the peak of the protests, it is estimated that almost half of the country’s population mobilized and protested on the streets.²¹⁷ Despite growing support, the unity among opposition parties suffered from debates between formal movement leadership and highly regarded street activists over whether to negotiate with the regime.²¹⁸

The al-Khalifa regime attempted negotiations with opposition forces, including the leading Shiite organizations, opposition demands, however, could not be met.²¹⁹ Saudi Arabia’s intervention on March 14 enabled Bahrain to redirect its forces the following day and violently remove the protestors from Pearl Square.²²⁰ During this crackdown, regime forces demolished the Pearl Roundabout, a symbol of resistance adopted and occupied by protesters.²²¹ In addition to clearing the square and demolishing symbols of protest, security forces in Bahrain detained, arrested, and removed protesters and opposition leaders throughout segments of society.²²² The monarchy in Bahrain also employed a series of nonviolent tactics, including payoffs, secret meetings to discuss possible reforms, and its own use of social media to flood the information domain with messages disparaging the activists.²²³ Saudi Arabia’s involvement provided support to the regime as well as support in the information arena.²²⁴ In many ways, the protests in Bahrain highlighted new uses of social media and news media by activists to promote

²¹⁵ Ibid.

²¹⁶ Lynch, *The Arab Uprising*, 136.

²¹⁷ Ibid., 110.

²¹⁸ International Crisis Group, “The Bahrain Revolt,” 6.

²¹⁹ Amnesty International, “Flawed Reforms: Bahrain Fails to Achieve Justice for Protesters,” Amnesty International (2012): 7, retrieved June 23 2013, from <http://www.amnesty.org/en/library/info/MDE11/014/2012/en>.

²²⁰ International Crisis Group, “The Bahrain Revolt,” 9.

²²¹ Lynch, *The Arab Uprising*, 111.

²²² Ibid., 111.

²²³ Ibid., 138–139.

²²⁴ Ibid.

their causes, by regimes to send a counter message, and by state-influenced regional media to eliminate broadcasts of protests entirely.²²⁵

Egyptians, Yemenis, and Bahrainis gathered in their cities and towns in protest during the Arab Spring over similar grievances, facing different levels of regime repression, and achieving different levels of success. While Egyptians and Yemenis faced significant economic hardships and the Bahraini citizens were economically more prosperous, the profound sense of injustice resulting from regimes no longer protecting their citizens or respecting human dignity was rampant. Each country faced strong social divisions between religious sects, tribes, or various opposition movements. Despite these divisions, each country also witnessed young, disaffected student activists corroborated with well-organized opposition parties to draw protesters from many corners of society. Various forms of regime repression also marked each country, Egypt's protestors faced marginal repression compared to the live ammunition fired by Yemeni forces, and the extreme violence waged by Bahrain's security forces. Despite differences in grievances, mobilization, and repression, the protests in Egypt, Yemen, and Bahrain were influenced by new applications of social media and women protesters on the streets and on the web.

D. SOCIAL MEDIA: THE REVOLUTIONARY'S MEGAPHONE

One of the most talked-about features of the Arab Spring was the use of social media as a tool for coordination between activists and communication to the outside world. Yet the data questions the importance of social media to activism, stressing the primacy of traditional organization and mobilization. Polls estimate 80 percent of Egyptians owned a cell phone in 2010, and Facebook had nearly 5 million users in the Arab world by the time protestors gathered in Tahrir.²²⁶ By contrast, Yemen ranks exceptionally low in terms of education and computer use. In December 2010, less than 10 percent of Yemenis had Internet access, and less than 0.75 percent of Yemenis used

²²⁵ Ibid., 140.

²²⁶ Castells, *Networks of Outrage and Hope*, 57.

Facebook.²²⁷ The youth, who represent over 60 percent of the Yemeni population, are the predominant Internet users in Yemen.²²⁸ While limited in access to social media, Yemeni youth activists used Facebook and online forums to connect geographically disparate groups, coordinate protest plans and repertoires, and debate ideas.²²⁹ Bahrain, given the considerable wealth and education of its population, had extensive mobile phone and Internet access and a well-developed community of social media activists.²³⁰ Bahraini activists however, the opposition with the most technologically connected populations to engage, experienced far less success during the Arab Spring than their counterparts in Egypt and Yemen.

1. Years of Practice

Each country entered the Arab Spring with its own virtual and physical histories of activism and mobilization. Yemeni civil society, with its exceptionally low Internet connectivity, relied heavily on traditional forms of public gatherings and forums for discussion, organization, and mobilization such as “Qat chews.”²³¹ While opportunities to employ social media to mobilize wide groups of people were limited in Yemen, activists nonetheless saw opportunities to use social media to connect disparate communities of people through other online activists.

Egyptian and Bahraini activists, by contrast, had practice employing social media to organize and mobilize. The Egyptian *Kifaya* movement in 2005 took advantage of new communications technology and coordinated their efforts via the Internet. This combination of nonviolent protest and new technology continued in Egypt and was used

²²⁷ International Crisis Group, “Yemen between Reform and Revolution,” ii. “Qat chews” traditionally provided a public forum where grievances can be addressed and ideas discussed, as well as provide a space for oppositional mobilization and discourse. Qat is a mild narcotic plant that acts as a stimulant and is often chewed after lunch by Yemeni men.

²²⁸ Atiaf Alwazir, “Social Media in Yemen: Expecting the Unexpected,” *Al Akhbar English*, last modified December 30, 2011, <http://english.al-akhbar.com/content/social-media-yemen-expecting-unexpected>.

²²⁹ Ibid.

²³⁰ Dewey et al., “Impact of Social Media,” 21–22.

²³¹ International Crisis Group, “Yemen between Reform and Revolution,” ii.

by the April 6 youth movement, who first employed Facebook to and encouraged protestors to strike in 2008.²³² The “We are All Khaled Said” Facebook group formed in July 2010 and used social media tools to coordinate and conduct peaceful demonstrations that expanded in size and organization.²³³ The April 6 youth movement also coordinated activities online and adapted their tactics to circumvent government repression employing advice from other movements that avoided Internet monitoring.²³⁴ These practices enabled the opposition leadership to coordinate activities without being detained or repressed by security forces.²³⁵ Online networks also linked other networks to protest movements, including soccer fans and Tunisian protestors, which added to the numbers of protestors and enabled the diffusion of tactics.²³⁶ As opposition activities accelerated, the National Coalition for Change used social media to promote the success of the Tunisia revolution and promote the political opportunity to protest.²³⁷ Social media was used in advance of the Egyptian uprisings as a free space for activists to coordinate efforts, generate consensus on issues, gain support, and educate protestors. As the Arab Spring approached, Egypt’s opposition forces had enough practice employing social media and modern communications technology to stay ahead of government repressive forces.

Much like Egypt, Bahrain’s networked community of online activists spent years employing social media such as blogs and Internet forums to support mobilization. Despite regime repression, Bahrain’s online forums transformed into, “fully engaged public spheres where Bahrainis openly discussed human rights and broader politics” expressing grievances that applied to all of Bahrain’s citizens, and not just the Shia communities.²³⁸ Bahrain’s extensive blogosphere united both Shi’a and Sunni bloggers

²³² Stephan, *Civilian Jihad*, 214.

²³³ International Crisis Group, “Egypt Victorious?,” 1.

²³⁴ *Ibid.*, 9.

²³⁵ *Ibid.*

²³⁶ Castells, *Networks of Outrage and Hope*, 55.

²³⁷ *Ibid.*, 11.

²³⁸ Lynch, *The Arab Uprising*, 109–110.

and formed a new level of interconnectivity. Opposition members coordinated both on and offline and had access to a growing number of resources and debates.²³⁹ In the years leading up to protests in Bahrain, the community of online activists grew and many bloggers began to meet to discuss issues regularly at the Crown Plaza Hotel in Manama.²⁴⁰ These public gatherings moved virtual debates into the real world, potentially strengthening ties between activists, creating a sense of solidarity, and lowering barriers to protest. As connectivity expanded through urban areas and villages, Internet forums such as Bahrain Online evolved to an open forum for opposition parties to organize, coordinate protests and collective action, and critique both local and national issues.²⁴¹ Unlike Egypt and Yemen, however, the Bahraini regime recognized the potential threat posed by these activists and worked to silence opposition voices and provide a counter narrative.²⁴²

Although social media tools had varying reach and influence in each country, they connected activists and facilitated social movement planning, discourse, and communication. Social media and Web 2.0 technologies can be used to encourage civic participation and engagement, provide spaces for free speeches, encourage political networking, create associational space, and enable activists to coordinate and execute protests.²⁴³ As activists mobilized during the Arab Spring the virtual world evolved as a space for discourse and communication. Initial planning was conducted in one-to-one forums, such as short message service (SMS) (i.e. texting, or Google's "GChat" instead of broadcast social media programs), as decisions were made other social media programs such as Twitter or Facebook were employed to broadcast information to various organizations.²⁴⁴ The comprehensive layers of social media used to coordinate in

²³⁹ Schleusener, "From Blog to Street."

²⁴⁰ Ibid.

²⁴¹ Ibid.

²⁴² Lynch, *The Arab Uprising*, 109–111.

²⁴³ Ibid., 1.

²⁴⁴ Ibid., 14.

small groups, avoid regime repression, and broadcast decisions and guidance to a wide audience all formed part of successful social media strategies during the Arab Spring.

2. #Mobilization

As the Arab Spring protests evolved, activists used social media to promote the demonstrations, coordinate mobilization, avoid repression, and delegitimize government actions. Facebook served as a planning space, Twitter and SMS facilitated communication among activists before and during protests, and YouTube was used to communicate the protests to regional and international media.²⁴⁵

In Egypt, Facebook posts from opposition movements communicated protest repertoires and guidance and provided tactics, slogans, and recommendations for protest safety.²⁴⁶ In addition to Facebook postings and YouTube videos, maps were posted online to show protesters where to avoid police and repressive forces, thus keeping them safe and avoiding confrontations.²⁴⁷ Twitter communicated repertoires for marches, protests, and even served as a means to distribute coordinating instructions to enable more people to participate or show support. In one example, a link for a document on Google Drive was sent out via Twitter prior to the protest. This document contained information on grievances, slogans and chants, items to bring, phone numbers to call in the event of injury or arrest, and contact information for the leaders of each protest march in the city.²⁴⁸ The diverse employment of social media, the quality of the message, and the quantity of networks the messages reached helped the demonstrations gain strength and support in Egypt.

²⁴⁵ Castells, *Networks of Outrage and Hope*, 58.

²⁴⁶ Khamis and Vaughn, "Cyberactivism in the Egyptian Revolution," 13.

²⁴⁷ Ibid., 14.

²⁴⁸ Ibid; A google document link was identified through the use of Topsy Analytics as a trending link. This URL links to a document listing the protest repertoire and coordinating instructions for the January 25 protests in Egypt. Last accessed on July 24, 2013, <https://docs.google.com/document/d/1qU3TnumUD5ZzZN9CEBbDRIZNvcjbOtJX5CkcBcC9OjI/preview?sle=true>.

For Yemeni activists, social media not only linked activists but also provided new protestors with means to circumvent formal politics and associated power structures. State institutions, formal political parties, and private organizations controlled Yemeni media, this leaves little room for emerging activists to be heard.²⁴⁹ Social media provided a way for activists to connect as well as circumvent state controlled media and gain a share of the opposition voice without having to join the JMP or other formal organizations.²⁵⁰ Student activists at Change Square in Sana'a used Facebook, blogs, and YouTube channels to share news, photographs, and videos with local, regional, and international media.²⁵¹ Even today, activists continue to use social media as a means of citizen journalism and a way to document human rights violations.²⁵² While social media did not play as visible of a role in Yemen as it did during the Egyptian revolution, it performed similar functions, allowing opposition forces to organize, coordinate, and share news of the protests with the world.

Many of the emerging youth activists in Bahrain employed social media to bypass formal opposition groups as well. In February 2011, two youth groups issued online statements and communiqués that further reflected a lack of unity among protesters. The first group, the “Youth of the 14 February Revolution” issued demands for complete regime removal and democratic transition, whereas “The Bahrain 14 February Peaceful Movement” promoted a constitutional monarchy and democratic reforms.²⁵³ Another opposition group, the Bahrain Youth Society for Human Rights and some of its contemporaries employed social media tools as a way to convey information to protestors as well as the international community.²⁵⁴ Among activists in each country social media was employed to coordinate, communicate repertoires, and express their grievances.

²⁴⁹ Alwazir, “Social Media in Yemen: Expecting the Unexpected.”

²⁵⁰ Ibid.

²⁵¹ Ibid.

²⁵² Ibid.

²⁵³ International Crisis Group, “The Bahrain Revolt,” 20.

²⁵⁴ Ibid., 20.

3. Repression

Social media played a significant role in providing a narrative of the protests to regional and international media, countering state sponsored media, and documenting regime repression. Activist videos were uploaded near-real time onto the Internet and picked up by satellite television and news stations, which made sharing views and developing a collective identity easier, lowered barriers to protest, and educated a wide audience about the protests.²⁵⁵ The application of social media to reveal government repression and regime-led violence against nonviolent protesters mobilized more individuals who were outraged at the regime's injustice.

In Egypt, the government ordered an Internet blackout to halt the opposition's use of social media. Not only did this blackout drive more protestors into the streets in anger, it also led to activists using more creative means of sharing information such as File Transfer Protocol (FTP), landlines, and dial-up modems.²⁵⁶ Activists also worked through sympathetic Internet-savvy activist networks in other countries, and Google and Twitter developed "Speak 2 Tweet" to allow protestors to continue sharing their experiences through their cell phones.²⁵⁷ Not only was the Internet disruption ineffective, it may have cost more than 90 million dollars in revenue for Egypt during the five-day blackout.²⁵⁸ As Castells notes, "Once a social movement has reached a certain threshold of size and impact, closing the Internet is neither possible nor effective."²⁵⁹

In addition to state blackouts, opposition movements employed social media to counter state sponsored media and pro-regime messaging, posting photographs of regime brutality.²⁶⁰ Bahrain's activists employed social media to communicate messages that

²⁵⁵ Ibid., 4.

²⁵⁶ Ibid.

²⁵⁷ Castells, *Networks of Outrage and Hope*, 63-64.

²⁵⁸ Ibid., 65.

²⁵⁹ Ibid., 66.

²⁶⁰ Lynch, *The Arab Uprising*, 10-11, 139.; Yemen Rights Monitor Blog Archives from February – March 2011, retrieved August 2, 2013, from <http://www.yemenrightsmonitor.blogspot.com>.; 14 February Media Group from Bahrain, retrieved August 11, 2013, from <https://www.facebook.com/14Feb.Media>.

contradicted the regime propaganda, while the regime claimed the protestors were an Iranian “fifth column,” the activists communicated messages of nationalism, unity, and peaceful protest to the world.²⁶¹ Bahrain’s social media landscape became contentious territory between the protesters and the regime.

Throughout the protests, social media was perceived as faster than spreading leaflets, but the necessity of physical mobilization was not ignored.²⁶² Organizers such as Wael Ghonim stressed to members of their online constituency that they needed to spread the word and get others mobilized and out on the streets.²⁶³ Social media enabled opposition movements to coordinate outside the watchful eye of the government, provided a means to communicate information to a wide range of activists and networks and develop shared grievances, identities, and protest agendas. As people mobilized, social media provided a way to communicate protest details to a wide audience and quickly create a level of cohesion among a large group. The new media also helped to delegitimize governments, report regime repression, incite anger against government repressive measures, and gain the attention of the international community through news media.

E. WOMEN: ON THE STREETS AND ON THE WEB

Women, a group largely perceived as marginalized in Middle Eastern cultures and societies, firmly established a presence both on the streets and in online social media sites and virtual social movement networks that were traditionally considered public and masculine spaces.²⁶⁴ However, despite their online presence, the 2011 Arab Social Media Report identifies a “gender gap” in cyberspace due to lower numbers of female Internet use than the global average.²⁶⁵ The differences between the number of women and men on the Internet primarily attributed to social and cultural factors, rather than Internet

²⁶¹ Lynch, *The Arab Uprising*, 110.

²⁶² Khamis and Vaughn, “Cyberactivism in the Egyptian Revolution,” 13.

²⁶³ *Ibid.*, 12.

²⁶⁴ Newsom and Lengel, “Arab Women, Social Media, and the Arab Spring,” 37.

²⁶⁵ “Arab Social Media Report: The Role of Social Media in Arab Women’s Empowerment,” 5.

access or education opportunities. Regional opinion polls cite the two biggest reasons people view as the cause of the gender gap include social and cultural barriers and privacy concerns; national opinion polls reflect a similar trend with an even greater focus on societal/cultural limitations.²⁶⁶ While women faced significant challenges to virtual and physical activism, they were, nonetheless leaders, organizers, and participants during the Arab Spring protests.

Women in Egypt, Yemen, and Bahrain had a unique history of participation in civil society and collective action that informed their participation in the Arab Spring protests. Women in Egypt have a history of cyberactivism, citizen journalism, and social mobilization. Activist women such as Esraa Abdel Fattah, a founder of the April 6 youth movement, coordinated protests both on and offline in the mid-2000s, while women journalists like Mona Eltahawy and Nora Younis reported and relayed events.²⁶⁷ The history of activism and participation afforded these women legitimacy and credibility before the uprisings started, which made them valuable sources of information as the protests began.²⁶⁸ At the height of the protests in Tahrir square it is estimated that almost 25 percent of the million protestors were women.²⁶⁹

Women were also highly visible participants in many of the protests in Yemen due to a history of female-led charitable and religious associations that enabled female protest organizers to leverage a complex network of social ties. The separation of Yemeni women from men, to include private *Nadawat* gatherings and female-only organizations enabled women to lay the groundwork and create the networks necessary for high risk

²⁶⁶ Ibid., 5. The Arab Social Media report identifies that 26 percent of men and 26 percent of women believe “Societal and cultural limitations “explain the gender gap on the Internet. The second most popular explanation was “Privacy/Security” Concerns, cited by 16 percent of men and 15 percent of women. By comparison, only nine percent of men and 10 percent of women viewed lower female education levels as an explanation for the “virtual gender gap.”

²⁶⁷ Radsch, “Unveiling the Revolutionaries,” 14.

²⁶⁸ Ibid., 14.

²⁶⁹ Khamis and Vaughn, “Cyberactivism in the Egyptian Revolution,” 17.

mobilization.²⁷⁰ This history of women's organizations produced a generation of female leaders that were connected to multiple civil society organizations, well organized, and capable of mass mobilization.

Among the women who organized protests, the most prominent is Tawakkol Karman, the first Arab woman to be awarded the Nobel Peace Prize. Karman organized weekly protests in Sana'a from 2007 through 2011, as well as student protests calling for the removal of President Saleh's regime.²⁷¹ Her leadership role in the Yemeni revolution evolved through years of engagement in various realms of Yemeni civil society and activist groups. Her ability to network across multiple organizations as well as years of experience organizing protests contributed to the successful mobilization of Yemeni women.²⁷² Islamic charities and societies provide Yemeni women with opportunities to participate politically, religiously, and civically in Yemeni life; they develop informal links to multiple organizations focused on charity, welfare, religion, and education as they execute their tasks and provide services.²⁷³ Women participating in the Islah Charitable Society, *Nadawat* gatherings, the Hizb al-Islah, or other civic organizations frequently have social ties to other groups and organizations that they maintain in the conduct of their charitable work, these dense networks of cross cutting cleavages provide Yemeni women the capacity for social mobilization.²⁷⁴ In addition to Islamist women,

²⁷⁰ Janine A Clark, *Islam, Charity, and Activism: Middle-Class Networks and Social Welfare in Egypt, Jordan, and Yemen* (Bloomington, IN: Indiana University Press, 2004), 133.

²⁷¹ Farea al-Muslimi, "The Social Transformation of Yemen's Youth Revolution," *Al-Monitor*, last updated March 8, 2011, <http://www.al-monitor.com/pulse/politics/2013/04/transformations-youth-yemen.html>; Stacy Philbrick Yadav, "Tawakkul Karman as Cause and Effect," *Middle East Research and Information Project* (2011), retrieved on May 15, 2013, from <http://www.merip.org/mero/mero102111>.

²⁷² Yadav, "Tawakkul Karman." Karman is a member of the Islah party, a journalist, a human rights campaigner, and the founder of the activist organization "Women Journalists Without Chains."

²⁷³ Clark, *Islam, Charity, and Activism*, 137–139.

²⁷⁴ *Ibid.*, 143–144.

secular women including Bushra al-Maqtari, Awra Uthman, and Amal al-Bahsha, led protests in Taiz and other cities.²⁷⁵ Women, secular and conservative, mobilized across Yemen during the spring of 2011.

Many Bahraini women also took to the Internet and the streets in protest during the Arab Spring. Women like Maryam and Zeinab al-Khawaja, blogger Lamees Dhaif, and Facebook user Ayat al-Gomezi used social media to speak out against the regime and document arrests and human rights abuses.²⁷⁶ Many of these women were harassed, arrested, or had their families threatened by security forces due to their Internet activity.²⁷⁷ During the protests, female doctors and nurses helped treat people injured by security forces, often at the risk of being detained and arrested.²⁷⁸ Women in Bahrain mobilized alongside men, virtually and physically, and were arrested, tortured, and harassed alongside their male counterparts.

Interviews, photos, Twitter, and blog postings reflected a new generation of female activists who were equally willing to take to the streets and to the web. News reports, journal articles, and studies provide evidence that women used social media to contribute to the success of these protest movements. Female involvement in the planning, discourse, and execution of these protests, both online and offline, contributed to the successful mobilization of millions of people across the Middle East in early 2011.

1. Gender and Nonviolent Protest

Women's leadership roles as organizers of protests influenced the selection of protest repertoires, to include nonviolent protest tactics. As protest leader Tawakkol Karman stated in an interview with Al-Jazeera, "Taking to the streets in peaceful protests is the only way. I learned about anti-violent struggle from reading and I owe my passion

²⁷⁵ Zakaria al-Kamali, "Yemen's Women: Toppling Tradition," *Al Akhbar English*, last modified October 10, 2011 <http://english.al-akhbar.com/node/1023>. The women were members of the socialist party and critical of Islamist organizations at the time of reporting.

²⁷⁶ Radsch, "Unveiling the Revolutionaries," 12, 21–22.

²⁷⁷ International Federation for Human Rights, "Women and the Arab Spring," 49; Radsch, "Unveiling the Revolutionaries," 21–22.

²⁷⁸ International Federation for Human Rights, "Women and the Arab Spring," 46–48.

for peace to Mahatma Gandhi, Nelson Mandela and Martin Luther King.”²⁷⁹ As part of the nonviolent repertoire in Yemen, pink was chosen as a color to symbolize the revolution and set the tone for peaceful protests.²⁸⁰ The prominence of Yemeni women in organizing and leading protests may have contributed to the use of nonviolent protest repertoires.

Egyptian Asmaa Mahfouz’s video blog called for Egyptians to come to the streets and occupy Tahrir, but did not call for violence; this call was reinforced with nonviolent protest instructions distributed over social media.²⁸¹ In Bahrain, some of the earliest protest footage featured Zeinab al-Khawaja peacefully protesting in the middle of a traffic roundabout and being forcibly removed by security officers.²⁸² The capacity for women to influence the protest repertoire choices and demonstrate peacefully not only encouraged nonviolent protests, but also delivered a more inclusive protest narrative to the international community.

2. Contributions to Diversity and Innovation

Women who employed social media diversified their communication tactics, linking blogs to Twitter accounts, posting links on Twitter accounts to photo and video dumps, and providing Facebook and blog links within their own blogs. In Egypt, Mona Seif, used her blog to post the demands of the protestors prior to the protests, share protest petitions, and detail her personal experiences participating in the protests through pictures and words.²⁸³ She continued to relay protest experiences and testimonies of individuals who were beaten or arrested by the police.²⁸⁴ Her employment of personal

²⁷⁹ Fatma Naib, “Karman: Peaceful Revolution ‘Only Solution’,” *Al Jazeera English*, last modified October 8, 2011, <http://www.aljazeera.com/indepth/features/2011/10/2011107172033851656.html>.

²⁸⁰ Yadav, “No Pink Slip for Salih.”

²⁸¹ Radsch, “Unveiling the Revolutionaries,” 3

²⁸² *Ibid.*, 21.

²⁸³ Mona Seif, “Long live the Revolution of the Egyptian People,” *Ma3t’s Bits and Pieces* (blog), January 30, 2011, *Ma3t’s Bits and Pieces* (blog), January 30, 2011, retrieved August 3, 2013, from http://ma3t.blogspot.com/2011_01_01_archive.html.

²⁸⁴ Seif, “Another Testimony of Military Brutality on Protestors,” *Ma3t’s Bits and Pieces* (blog), February 28, 2011, retrieved August 3, 2013, from http://ma3t.blogspot.com/2011_02_01_archive.html.

experience and street reporting evoked both sense of injustice and humanized the protest stories. She linked her blog entries to her Twitter account (@monasosh), and thus broadcast her messages to her followers on Twitter, who then Retweeted her accounts. In addition to providing links to her blogs on Twitter, she also provided links to her Flickr account, where she posted photos of the protests from her participation, which were also Retweeted.²⁸⁵ Journalist and Twitter user, Zeinobia's Twitter posts and blog entries are in English, thus reaching a wider audience. Her reporting and activism, complete with pictures, Flickr photo uploads, videos, polls, and links into worldwide blogs, connect her online activism as well as her followers to an international community, garnering international attention to opposition movements within borders of Egypt.²⁸⁶ Egyptian women engaged their audiences through innovative and diverse applications of social media.

Yemeni women, while not as prolific as Egyptian women online, demonstrated diversity and innovation through their participation in civil society. Other protest organizers, such as Bushra al-Maqtari and Awra Uthman employed blogs and Facebook posts to communicate issues to the outside world.²⁸⁷ While social media was not as prevalent in Yemen as it was in other Arab Spring countries, activists still employed a wide range of social media to communicate Yemen's revolution, thus contributing to the diversity of the protests.

3. Collective Identity

Female demonstrators mobilized with visible markers of a nationalist collective identity. Pictures of women wearing both secular and Islamic dress in all countries with

²⁸⁵ Mona Seif, "@Monasosh" Twitter posts from January 30-February 2, 2011, retrieved August 3, 2013, from <https://twitter.com/search?q=from%3Amonasosh%3A%20since%3A2011-01-25%20until%3A2011-02-05&src=typd>.

²⁸⁶ Zeinobia, "@Zenobia" Twitter posts from January 30- February 2, 2011, Accessed August 3, 2013; Zeinobia, "#Jan29: After the 28th," *Egyptian Chronicles* (blog), January 29, 2011 retrieved August 3, 2013, from <http://www.egyptianchronicles.blogspot.com/2011/01/jan-29-after-28th.html>.

²⁸⁷ Jamal Jubran, "Bushra Al-Maqtari: Writing the Yemeni Revolution," *Al Akhbar English*, last modified December 31, 2011, <http://english.al-akhbar.com/node/2940>.; Hind Aleryani, "Yemen's Revolutionary Women under Attack" *Comment Middle East*, last modified March 12, 2013, <http://commentmideast.com/2013/03/yemen-revolutionary-women-under-attack/>.

national colors, painted flags, and other symbols of nationalist pride portray their status as citizens of a nation.²⁸⁸ Whether participants or leaders of protests, women who selected national symbols and colors as part of their protest repertoire reinforced their nationalist identity and their right to protest alongside their fellow citizens. The use of national identity as a unifying group identity increased the potential population of protesters by incorporating members of various religious sects, tribes, and civil organizations, and the women who were associated with each.

4. Communication

One area where women in the Arab Spring enhanced the protests was through their communication of events on social media networks. Women employed various social networks to restate movement demands, detail the events of a protest, and provide reports and pictures following protest events. In Egypt, prior to events, women used social media to restate the goals of the protests to their audiences, both domestic and international. Hadota, an Egyptian woman used social media to spread news of the protests through Twitter and also employed her blog to consolidate the demands of bloggers and spread a petition demanding the investigation of the Minister of Information.²⁸⁹ Zeinab Samir frequently marked her Tweets with the Hashtag “#25Jan” and also used her blog to reiterate the demands of the protestors and provided links to Facebook pages with these demands, thus linking her social media network to a wider community of activists.²⁹⁰

²⁸⁸ International Federation for Human Rights, “Women and the Arab Spring: Taking Their Place?.”

²⁸⁹ Hadota, “Text Communication Any Egyptian Can Submit to the Attorney General Against Anas el,” *Hadota* (blog), February, 9, 2011, retrieved August 1, 2013, from http://hadouta.blogspot.com/2011_02_01_archive.html; Hadota, “The Demands of the Egyptian Revolution From Tahrir Square,” *Hadota* (blog), February, 10, 2011, retrieved August 1, 2013, from http://hadouta.blogspot.com/2011_02_01_archive.html; Twitter data from Deen Freelon #Jan25 archive, retrieved July 23, 2013, from <http://dfreelon.org>.

²⁹⁰ Zeinab Samir, “January 25,” *Egyptian Girl* (blog), January 20, 2011, retrieved August 1, 2013, from <http://www.bentmasreya.net/search/label/%D9%A2%D9%A5%20%D9%8A%D9%86%D8%A7%D9%8A%D8%B1>; Samir, “For a Complete Revolution. Statement,” *Egyptian Girl* (blog), February 25, 2011, retrieved August 1, 2013, from <http://www.bentmasreya.net/search/label/%D9%A2%D9%A5%20%D9%8A%D9%86%D8%A7%D9%8A%D8%B1>.

During the Arab Spring protests, women used social media to engage a wider audience than they would otherwise have access to. Mona Eltahawy, an Egyptian journalist in New York during the uprisings translated Egyptian events, connecting English and Arabic followers and reporting on the events of the uprising.²⁹¹ In Yemen, videos were posted via Facebook and Blog sites and retransmitted by cyberactivists over satellite television channels.²⁹² This enabled Yemenis, and isolated Yemeni women in particular, to see the revolution as it happened and mobilize a wider audience.²⁹³ The capacity to communicate Yemen's revolution both internationally and domestically was an important factor in sustaining widespread mobilization.

Social media activists in Egypt, Yemen, and Bahrain understood the magnifying power of social media. Lamees Dhaif blogged and Tweeted about Bahrain's protests to an audience that was between four and five times larger than Bahrain's newspaper audience.²⁹⁴ Human rights activists, such as Zeinab and Maryam al-Khawaja employed Twitter as a method to communicate their ideas and document human rights violations by regime security forces.²⁹⁵ These female activists understood their messages were circumventing regime censorship, reaching a wider audience, and reaching an audience that could not be repressed by security forces in Bahrain. Protesters in Bahrain also had a history of using "Moblogs," communicating what activist on the street with a mobile phone reported to a blogger who could continually provide updates via blog posts.²⁹⁶ In these examples, and many others, women employed social media to communicate events as they were happening detail their personal experiences.

²⁹¹ Radsch, "Unveiling the Revolutionaries," 15.

²⁹² Ibid., 18.

²⁹³ Ibid.

²⁹⁴ Ibid., 12.

²⁹⁵ Ibid., 33.

²⁹⁶ Schleusener, "The Bahraini Public Sphere in Transition," 1.

5. Lowering Barriers to Protest

Women faced a variety of threats from both virtual and physical mobilization during the Arab Spring that formed barriers to protest. In addition to ever-present threats of sexual assault and regime repression, many female activists faced slander, defamation, and even imprisonment. Social media was used as a way to circumvent many physical threats, reinforce a sense of “safety in numbers” and virtue, and contradict regime repression.

During the 18 days of protest in Egypt, there were very few reported assaults against women in Tahrir Square; this was a decrease in reported assaults from prior to the protests.²⁹⁷ Women remained in the square alongside men, regardless of curfews or social norms as leaders, organizers, and protesters.²⁹⁸ In some cases, women mobilized with other female relatives and friends, drawing more women to protest and creating a sense of “safety in numbers.”²⁹⁹ Women also served as guards to conduct security checks on other women entering Tahrir square, thus enabling women to enter the protests without being subject to a physical search by men and further lowering a social barrier to protest.³⁰⁰

Social media was also used to provide advice on safety to the protesters, offering specific instructions for women in order to avoid sexual assault.³⁰¹ Physical mobilization is not without risk: In Egyptian protests following the Tahrir square uprising, the military

²⁹⁷ Althea M Middleton-Detzner, and Jillian M. Slutzker, Samuel F. Chapple-Sokol, and Sana A. Mahmood, “Women and the Egyptian Revolution: A Dream Deferred?,” *The Palestine-Israel Journal of Politics, Economics, and Culture* 17, no. 3&4 (2011): 112.

²⁹⁸ Nadia Taher, “We Are Not Women, We Are Egyptians,” Open Democracy, retrieved August 3, 2013, from <http://www.opendemocracy.net/5050/nadia-taher/we-are-not-women-we-are-egyptians-spaces-of-protest-and-representation>.

²⁹⁹ Jenna Kajeski, “Women Are a Substantial Part of Egyptian Protests,” last modified January 27, 2011, http://www.slate.com/blogs/xx_factor/2011/01/27/egyptian_protests_women_are_a_substantial_part.html.

³⁰⁰ Middleton-Detzner et al, “Women and the Egyptian Revolution,” 111.

³⁰¹ Michel Martin, “Women Play Vital Role in Egypt’s Uprising,” National Public Radio, last modified February 4, 2011, <http://www.npr.org/2011/02/04/133497422/Women-Play-Vital-Role-In-Egypt-Uprising>.

attacked women, imposed virginity checks, or simply stood aside while assaults took place.³⁰² With safety concerns such as these, the Internet offers a relative safe-haven for female participation in protest activity.

Much like the protesters in Egypt, Yemeni women faced significant barriers to protest including the threat of violence and the challenges of household obligations. While Yemeni women found themselves assaulted by security forces, others faced slander and scathing public criticism.³⁰³ Additionally, female associational life in Yemen provided protesters with an extensive network of family members and friends to assist with household obligations and childcare, thus making participation in protest movements easier for some women.³⁰⁴

Regime repression, including the threat of violence and arrests formed another barrier to protest. Bahraini activists, both male and female, face significant jail time for their activities. During the protests, many who mobilized were subject to brutal repression from regime security forces. Following the protests, security forces investigated, harassed, and detained many of the protesters to include teachers, doctors who treated the injured, and social media activists.³⁰⁵ Many of these activists remain in detention, and subsequently employ social media to communicate with the outside world about their treatment.³⁰⁶ Free activists, in the meanwhile, use networked organizations such as the Bahrain Center for Human Rights, as well as their Twitter and Facebook accounts to campaign for the release of fellow activists.³⁰⁷ In recent years, many female activists have emerged to take the place of fathers, husbands, or other male relatives who

³⁰² Castells, *Networks of Outrage and Hope*, 72–73.

³⁰³ Jubran, “Bushra Al-Maqtari.”

³⁰⁴ Clark, *Islam, Charity, and Activism*, 135.

³⁰⁵ Amnesty International, “Flawed Reforms,” 6–8.

³⁰⁶ Amnesty International Livewire, retrieved August 9, 2013, from <http://livewire.amnesty.org/?s=bahrain&lang=en>. Blogs detailing individual experiences in detention can be found on Amnesty International’s website at

³⁰⁷ Bahrain Center For Human Rights Webpage and Twitter Feed, retrieved August 4, 2013, on <http://www.bahrainrights.org/en/about-us>.

remain detained by Bahrain's government.³⁰⁸ The use of social media use to educate, inform, and enhance the safety of mobilizing women helped lower barriers to physical protest while also providing women who were unable to mobilize with an alternate venue to demonstrate support for the protests.³⁰⁹

F. CONCLUSION

Women in Egypt, Yemen, and Bahrain mobilized in significant numbers both online and offline in the early months of the Arab Spring in 2011. Each protest faced similar grievances, yet struggled through different challenges to protest unity, and faced varying levels of regime repression. The combination of these issues, as well as mobilization opportunities and structures, shaped the outcome of each protest. Other factors, such as levels of violence, diversity and innovation, group identities, communication, and barriers to protest influenced the demographics of the mobilized population as well as the narrative of the protests. In many protests, women were leaders, organizers, social media activists, and took to the streets alongside their countrymen. Evidence suggests that women contributed to many aspects of the protests through social media, most notably the diversity and innovation of the protests and the communication of protest information and repertoires. The next chapter will explore female influence within the online protest communities to determine how quantifiable that influence may be.

³⁰⁸ "Meeting Human Rights Activists from Bahrain on World Day for the Victims of Torture" Amnesty International Global Human Rights Blog, retrieved August 9, 2013, from <http://livewire.amnesty.org/2013/06/28/meeting-human-rights-activists-from-bahrain-on-world-day-for-the-victims-of-torture/>.

³⁰⁹ Internet projects such as Harrassmap.org enable real-time reporting of sexual assault and harassment online forms, SMS, email, Twitter, and Facebook pages. HARASSmap, HARASSmap Homepage, <http://www.harassmap.org/en>; HARASSmap Facebook Page, retrieved September 3, 2013, from <https://www.facebook.com/HarassMapEgypt?ref=stream>; HARASSmap Twitter Page, retrieved September 3, 2013, from <https://twitter.com/harassmap>.

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IV. DATA

A. INTRODUCTION

Women in Egypt, Yemen, and Bahrain played a noteworthy role in the Arab Spring protests both on the streets and in the virtual world. As virtual networks were used to plan, coordinate, and report on protest activity, analysis of online social networks may provide insights on the differential impact of female participation. Twitter, an online micro blogging program, was selected for investigation because opposition movements used the program during the Arab Spring and Twitter data is publicly available.

Twitter networks are distributed networks of directed communications, where one user broadcasts messages that can be viewed by their followers as well as users following a topic of interest.³¹⁰ These networks are unlimited in their size and considered scale-free, whereby a small group of users can create a majority of the communications.³¹¹ Each communication, or “Tweet” is listed as an update that a user’s followers or friends can see.³¹² These updates consist of 140 characters that incorporate messages, content, or links that are broadcast to the user’s followers, directed to users in conversation, or directed to users by mentioning the user name in the post.³¹³ Twitter networks are asymmetric as not every individual communicating with another user receives a communication in return (examples include spamming or group messages).

The data set analyzed is a one-time, full Tweet retrieval of protest-centric Tweets originating from Egypt, Yemen, and Bahrain from January 23 to February 22, 2011. Once the data was structured, each data set was imported into software programs used for visualizing social networks and computing measurements of influence for individuals and groups within social networks. The predominant Twitter users were identified in each

³¹⁰ Joss Hands, @ *Is for Activism: Dissent, Resistance and Rebellion in a Digital Culture* (New York: Pluto Press, 2011), 119.

³¹¹ Ibid.

³¹² Ibid.

³¹³ Ibid.

data set through degree centrality scores indicating high volumes of messages sent from, or received by, each user. The identified user's profiles were queried through the Twitter search function to identify gender and location.³¹⁴

Network influence was assessed using centrality scores that provide a “rough indication” of an actor's power based on its position relative to the other actors in a network.³¹⁵ In terms of the Twitter data set, centrality scores provide an indication of each Twitter user's position and influence compared to the other Twitter users. The Twitter data forms an asymmetric, directed network representing communication patterns. As Twitter networks may not reflect a network of strong social ties, the centrality scores serve as only a partial indicator of influence. To provide additional indicators of potential influence, other factors such as number of contacts, Tweets, Retweets, and growth of friends and followers. These patterns along with influence scores were compared to determine the differential impact of women within this Arab Spring Twitter data set.

1. Key Findings

- The following key findings resulted from analysis of the data set:
- Egypt and Bahrain both presented protest-related Twitter data while Yemen had a very small protest-related Twitter network, indicating that Yemeni protestors relied more on traditional forms of mobilization and activism.
- In both Egypt and Bahrain, women followed over four times more user accounts on their Twitter feeds than men, giving women access to information from more diverse sources.
- In Egypt, women were nearly equally represented in the top fifty users of with the most connections in the data set. These women communicated more frequently, communicated to a wider range of users, and

³¹⁴ As there is no definitive way to verify gender online, gender was determined by any one or combination of: gender specific name, gender specific photo, user description of gender, or an embedded URL that linked to a blog or Facebook page with gender clearly stated. Profiles with no identified gender were ignored. Translations of Arabic words found on the profiles were done using Google Chrome's translate function.

³¹⁵ Everton, *Dark Networks*, 398.

communicated out to others more frequently than the influential men. Men in Egypt received more communications from others as opposed to sending communications.

- In Bahrain, women were sparsely represented in the top fifty users with the most connections and communicated less than their male counterparts. Like they Egyptian women, they were more likely to communicate out to another account than to receive a communication.

2. Twitter Data

The data set was acquired from Topsy Labs, Inc., a social media data and analysis company, consisting of 131,512 individual Tweets selected based upon date, protest-Hashtag, and location data. The data represents a sample of Tweets collected and identified as originating in Egypt, Yemen, or Bahrain from January 23, 2011 until February 22, 2011 using at least one of the identified protest-related Hashtags.³¹⁶ Once processed, the data comprised 15,756 nodes, or individual user accounts, and 59,271 links or connections between those user accounts. The individuals selected for analysis based on centrality are identified as being located in the country of interest.

B. EGYPT

The data set for Egypt is comprised of Tweets issued from January 23, 2011 to February 23, 2013, marked with any of the protest Hashtags, and geoinferenced to locations within Egypt.³¹⁷ This data includes 73,815 Tweets sent between 11,969 unique nodes with 39,517 links between the nodes. Once users of interest were identified, this data analyzed included 10 men and 10 women who produced 10,883 Tweets (14.74 percent of the Tweets in the data set). Most notably, women appeared among the top users in the data set in almost equal numbers as men. When compared to male users, females communicated more often and to more unique accounts. Thus, women

³¹⁶ Marc Lynch, *The Arab Uprising*, 104–112.

³¹⁷ Geoinferencing is a feature of Topsy data that allows Twitter user's location to be determined by published location, context, geo-tagging, and topics discussed. See Appendix for more details.

communicated to many different people, instead of a handful of accounts. Women also received information from more data sources, referenced specific protest activity more in their messages, and were Retweeted more often.

1. Egypt Centrality Score Comparison

Once centrality scores were computed, the fifty users with the highest degree centrality scores were selected to determine gender and location. This population represents the users in the data set with the highest number of contacts in the data set. For the first fifty users selected, 24 are identified as male, 21 are identified as female, and four are unable to be identified. From these accounts, 14 men and 11 women were located in Egypt.³¹⁸ The top ten male and female users were extracted for further analysis. For the select group of individuals, eight men and eight women listed self-identified occupations. In the male group, there were four journalists, three online activists or bloggers, and one human rights advocate. The female group also included four self-identified journalists or writers, two bloggers, and two computer software developers or engineers. The majority of these Twitter users were in Cairo, one was in Giza, and some of the activists did not have refined location information.³¹⁹

The most significant difference between the male and female groups of users is found in *degree centrality*, specifically *in-degree* and *out-degree centrality* (see Table 1).³²⁰ The out-degree centrality, or messages being sent from Twitter users, as well as its converse score calculating the number of messages being sent to a Twitter user, is very different. The average out-degree centrality for the female group (1212.9 *unscaled*) was

³¹⁸ See Appendix for gender and location identification. While there is a possibility that users have moved or location information is wrong, this is an estimate designed to pare down the data set based on Topsy data fields that identify locations submitted by the user and identified by the system as well as open source research.

³¹⁹ Four of the men did not have Tweets in the data set that were sent from their accounts, merely Tweets being sent to their accounts. This may be due to detention by security forces as mentioned in a Tweet from one of the protesters.

³²⁰ Degree centrality is based upon the number of ties an actor has to other actors, in-degree centrality is the number of ties coming into an actor or who talks to an actor, whereas out-degree centrality is the number of ties going out from an actor or who an actor talks to. See Appendix for more details.

twice as much as the same score for the male group (549.4 unscaled).³²¹ The scores indicate that, on average, women communicated by sending messages out to nearly twice as many different users than men did. Conversely, the in-degree centrality for the female group (294.1, unscaled) was a fraction of the male group (1047.2, unscaled). This indicates that while women sent information out to more unique nodes, men received information from more unique nodes. Essentially, women were constant communicators and transmitted information. The messages women sent potentially influenced more of the network than those of men.

A comparison of *hub* and *authority centrality* measures, which incorporate degree centrality scores, also reflects this data.³²² Hubs are nodes that send information to a wide range of others who receive information, whereas authorities are nodes that receive information from many links and can serve as good sources of information.³²³ In the data set, the women had a hub centrality measure of 0.072 and an authority centrality measure of 0.038, whereas men had a hub average of 0.021 and an authority average of 0.128. This calculation factors in-and-out-degree centrality scores, thus the women in the data functioned as hubs more often and linked out to many other individuals, while men received information from more individuals.

Furthermore, the groups of male and female users have similar scores in *betweenness* centrality, indicating little difference in their placement in the social space.³²⁴ This means that men and women have generally similar placement in the network to serve as information conduits among users. A difference in betweenness centrality would indicate one group is less central to information flow, and thus less influential, in the network. This, along with the equal participation of women in the

³²¹ The unscaled value represents the total number of links, without comparison to another network of similar size, see Appendix for more details.

³²² See Appendix for more details

³²³ “Ora User’s Guide,” ed. School of Computer Science Carnegie Mellon University, Institute for Software Research(Pittsburgh, PA: Carnegie Mellon University, 2013).

³²⁴ Betweenness centrality indicates how often a node lies on the shortest path between other nodes in a network, indicating the potential for information to pass through a node enroute to another node. See Appendix for more details.

Twitter data set, may indicate that there is less of a gender gap in the virtual world of Egyptian protestors than would be expected.³²⁵ This indicates that the gender divide may not be as sharp in the virtual world as it can be in the actual world of the Middle East, and if it is, this divide may vary by society.

Table 1. Centrality Score Comparison for Egypt Users of Interest

	Average Total Degree Centrality (unscaled)	Average Out-Degree Centrality (unscaled)	Average In-Degree Centrality (unscaled)	Average Authority Centrality	Average Hub Centrality	Average Betweenness Centrality
Men	887.3	270.6	620.7	0.128	0.021	0.00257
Women	889.6	730.4	173.3	0.038	0.072	0.00321

2. Egypt User Activity Comparison

Examining user activity offers some illumination. On average, the female users followed 8795 other user accounts, whereas the male users followed 2251 accounts. This indicates that women may be gaining information from a wider array of sources and sending it out to their networks. Thus the differential impact of women during the Arab Spring in Egypt may be their access to a wider range of information combined with a high amount of activity to relay that information to key nodes in the network.

Not only did women communicate to more users and follow more users, women also sent more messages. Women in the data set sent almost twice as many messages in total, as well as twice as many messages marked with protest-related Hashtags. Furthermore, 51.60 percent of women's Tweets during the timeframe were marked with protest Hashtags, and thus identifiable to anyone seeking information on the protests, whereas only 38.02 percent of men used the protest related Hashtags.³²⁶

³²⁵ "Arab Social Media Report: The Role of Social Media in Arab Women's Empowerment."

³²⁶ This does not presume that other hashtags were not more or less relevant to the protests, simply that women selected hashtags meeting the search criteria more often within the data set than men did.

Each group boasts a similar growth in followers, or the audience they can directly influence. The male group experienced an average follower increase of 97.09 percent, while the female group saw a similar increase of 103.3 percent. While the increase in followers was slightly higher for women, the number of messages that were *Retweeted* at least once was higher for women (51.89 percent) compared to men (33.17 percent).³²⁷ This does not necessarily indicate the effectiveness of these messages, but does indicate that female messages were relayed to other users more often than male messages.

Table 2. User Activity Comparison for Egypt Users of Interest

	Average Number of Followers	Average Growth in Followers	Average Number of Accounts Followed	Average Number of Tweets Sent	Average Number of Tweets in Data	Percentage of Tweets Meeting Search Criteria	Percentage of Collected Messages Retweeted
Men	3826.89	97.09%	182.79	8362	3538	38.02%	33.87%
Women	1996.32	103.31%	859.00	14721	7345	51.69%	52.77%

In summary, the most prolific women in the Egyptian Twitter protest networks were relatively equal to their male counterparts in terms of degree centrality. The most significant difference between the male and female group was in the distribution of information and the access to information. The data set of women had higher out-degree and hub centrality measures, indicating that they were communicating to a wider audience more than their male counterparts. The male data set had higher in-degree and authority centrality measures, indicating they were recipients of information more often than the women in the data set. Furthermore, the women in the data set followed more Twitter users than the men did, thus accessing a potentially wider and more diverse range of information. Despite the gender divide in cyberspace, the group of female Twitter users appeared to have similar total degree and betweenness centrality scores and growth in followers, as well as a higher number of messages Retweeted. While the women in the data set may not be more influential, they experienced similar levels of growth in their

³²⁷ Retweets are an indicator of influence within Twitter networks. A message is first communicated from a user to their followers, once a message is Retweeted by one or more users, it extends to each network of followers that *those* users communicate with.

followers as their male counterparts. Taken as a whole, the data set of women had access to a larger quantity of sources of information and transmitted that information to more individuals, whereas the male users followed fewer sources of information and received more information than they sent.

C. YEMEN

The data set from Yemen provided little insight into any existing Twitter networks during the protests. While the Egyptian Arab Spring protests ousted Morsi in 18 days, it took the Yemeni people nearly nine months of protests to remove Saleh. The slower escalation and progress of the Yemeni revolution may slightly explain the lack of a surge in Twitter feeds. More significantly, the low Internet penetration rate in Yemen and the challenges of historical data collection provide less data to work with. Yemenis did not have wide access to cellular phones or Internet services, and thus used bloggers outside the country and video dumps as a way to communicate protest news to the people of Yemen.³²⁸ Furthermore, the protests in Yemen continued for nearly a year before President Saleh left. The data for Yemen included 115 nodes, and 111 links, of which, the majority of messages were produced by one account, owned by Khalid Azani, a civil engineer in Sana'a. Additional requests for data covering additional timeframes would be necessary to determine if men and women in Yemen employed Twitter in support of the protests. While women in Yemen led much of the social organization, their leadership leveraged longstanding strong social ties built through civil society instead of social ties leveraged through new media. The lack of data on the importance of social media to Yemen serves as a strong reminder that social media does not create protests, but is one tool among many that protesters use.

D. BAHRAIN

The data set for Bahrain includes Tweets issued from February 7, 2011 to February 21, 2013, marked with any of the protest Hashtags, and geoinferenced to locations within Bahrain. This data includes 10,557 Tweets sent between 2,364 unique

³²⁸ Radsch, "Unveiling the Revolutionaries," 18.

user accounts with 4,740 links between the nodes. The data set for Bahrain included fewer female user accounts within the top fifty Twitter users than the data set for Egypt.³²⁹ Within the fifty users with the highest degree centrality, 32 are male, 12 are female, and six are organizations or unidentifiable. Of the 32 male accounts, 25 are Bahraini and seven are foreign, while within the 12 female accounts, only five are Bahraini and seven are foreign. In addition to a comparatively smaller presence in the Twitter network, women also produced fewer messages, and contacted fewer unique users.

1. Bahrain Centrality Score Comparison

The differences in average centrality scores for male and female accounts demonstrate that male Twitter users in Bahrain were more active in sending and receiving protest-related messages than women. The male user accounts had an average total degree centrality score of 415, whereas the predominant female Twitter users had an average total degree centrality score of 166. In terms of out-degree centrality, or the number of connections users had linking out to other users, male Twitter accounts had higher out-degree and in-degree centrality scores than female users did. The hub and authority centrality scores reflect a similar trend. Male accounts had higher authority centrality as well as hub centrality. Not only did men send and receive more messages than women, men were also sought after as authorities or sources of influence more often. The betweenness centrality measures in this data set show a significant discrepancy (0.27 for men, 0.03 for women), indicating men have a much closer proximity in the social space to other Twitter users than women. In terms of average centrality measures, male Twitter users in Bahrain engaged in more Twitter conversation about the protests to more unique users than women, possibly influencing the protests more than women.

³²⁹ As determined by total degree centrality scores.

Table 3. Centrality Score Comparison for Bahrain Users of Interest

	Average Total Degree Centrality (unscaled)	Average Out-Degree Centrality (unscaled)	Average In-Degree Centrality (unscaled)	Average Authority Centrality	Average Hub Centrality	Average Betweenness Centrality
Men	415.2	216.2	81.6	0.125	0.00424	0.27226
Women	165.6	94.2	71.8	0.0945	0.00444	0.02916

2. Bahrain User Activity Comparison

Women in the data had wider audiences and experienced a significant growth in followers during the time period. Male Twitter users averaged 212 users following their messages, whereas female Twitter users averaged 539 followers. Females also experienced a sharper increase in followers: one female activist, Maryam al-Khawaja, gained more than 3500 followers in the two-week period.³³⁰ Despite the growth in followership, slightly fewer female Tweets (48.80 percent) were Retweeted than male Tweets (54.06%). Retweets are an indicator of how far messages can influence people, thus this further indicates that women were, on average, less influential than men. It is possible that some of the growth in women's followers resulted from renewed international interest in female activists following the women's participation in the Egyptian protests and subsequent news reports.

Much like the female Twitter users in Egypt, women accessed information from a significantly larger number of sources. Bahraini women averaged 609 accounts followed, whereas men followed an average of 89 accounts. That said, the women in Bahrain did not relay this information as often to as many users as the Egyptian women did.

³³⁰ Male Average growth in Followers: 391%, Female average growth in followers: 5406%

Table 4. User Activity Comparison for Bahrain Users of Interest

	Average Number of Followers	Average Growth in Followers	Average Number of Accounts Followed	Average Number of Tweets Sent	Average Number of Tweets in Data	Percentage of Tweets Meeting Search Criteria	Percentage of Collected Messages Retweeted
Men	212.097	410.02%	89.13	1408.5	449.25	41.12%	71.35%
Women	539.61	1351.61 %	152.46	695.75	202	41.14%	48.80%

In terms of network centrality and Twitter usage, women in Bahrain were less connected and sent fewer messages than male users. While women had more followers, and experienced a significant growth in followers, as well as followed more sources of information than men, they did not spread that information as often, or to as many users, as the men did. Within the network of Twitter users discussing the Arab Spring protests in Bahrain, women contributed less information and communicated directly to fewer users than men in the network.

E. CONCLUSION

The two data sets examined paint different pictures of women's participation in online activism through Twitter. The relative equal representation of women and men among the most well-connected Twitter users further indicate that women played a substantial role in the Egyptian Arab Spring. These women were bloggers, journalists, and social media practitioners who potentially had a better understanding of how to connect and employ social media. They also communicated more frequently to more users. While women in Egypt did not receive as many messages as their male counterparts, they sent out more messages than male users did. In doing so, they exerted influence on the online discourse about the protests. Furthermore, women sought information from significantly more sources than their male counterparts. Access to multiple sources of information, whether protest-related or collateral information, may contribute to the diversity and innovation of the protests. The frequent communication to others can serve to continuously maintain and shape the protest narrative. Additionally, these messages keep people informed, both domestically and internationally. Finally, on

the most basic level, the interaction of women online in protest discourse in almost equal numbers to men, adds to the volume of protesters and protest chatter and may encourage the participation and support of others, thus lowering barriers to protest.

Conversely, Bahrain had fewer women participating in online protest activity during the Arab Spring. Compared to male Twitter users, the women in Bahrain connected to fewer users by sending or receiving messages. While women experienced a growth in their audience of Twitter followers, as well as followed more users than their male counterparts, they communicated less. Less communication may indicate that Bahraini women had fewer venues to express their ideas, relay diverse information, or influence protest narratives than their male counterparts. Additionally, the level of regime repression and the regime's history of targeting online activists possibly served as a deterrent to online activists.

Twitter networks broadcast significant quantities of information in near-real time. Therefore, the number of connections between users, the ability to broadcast information to a wide audience, and the participation in online protest activity can enable efficient communication and contribute to the momentum of a protest. Where female Twitter users appear in these online protest movements and how far they can reach with their messages contributes to the quantity and quality of online interaction among protestors and their supporters and may contribute to protest success.

In summary, women in the top fifty Twitter users were relatively equal with their male counterparts in terms of degree centrality. Despite the gender divide in cyberspace, the group of female Twitter users appeared to have similar degree centrality scores, growth in followers, and number of Retweets. While the women in the data set may not be more influential, they experienced similar levels of growth in their followers as their male counterparts. The most significant difference between the male and female group was in the distribution of information and the access to information. The data set of women had higher out-degree and hub centrality measures, indicating that they were communicating to a wider audience than their male counterparts. The male data set had higher in-degree and authority centrality measures, indicating they were recipients of information more often than the women in the data set. Furthermore, the women in the

data set followed more Twitter users than the men did, thus accessing a potentially wider and more diverse range of information. Taken as a whole, the data set of women had access to a larger quantity of sources of information and transmitted that information to more individuals, whereas the male users followed fewer sources of information and received more information than they sent.

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V. CONCLUSION

Women's mobilization in 2011 during the Arab Spring undoubtedly influenced the organization, conduct, and outcome of protests in Egypt, Yemen, and Bahrain, yet research has only begun to query the parameters of such influence. In Egypt, women reportedly comprised nearly 25 percent of the protestors in Tahrir Square and represented almost half of the most connected Twitter users in the data set analyzed.³³¹ In Yemen, women organized many of the protests, relying on strong social ties generated through years of community-level activism, and were not represented in the data set.³³² In Bahrain, the most heavily repressed protest in this research, women participated in protest activity, yet were less active in protest-related Twitter activities than their male counterparts.³³³ In comparing Twitter activity in Egypt and Bahrain, women appear far more central to the protests in Egypt, and it is possible that their engagement contributed to elements of protest success more so than women in Bahrain. In Yemen, while not represented in the Twitter data, women were heavily engaged in organizing protests and that engagement also allowed them to contribute to factors influencing protests success.

A. DISCUSSION OF FINDINGS

The Twitter data analyzed suggests that women in Egypt were almost equally represented in protest-related Twitter messaging during the two weeks surrounding the January 25 protests. The most prominent female Twitter users in the data set had similar results to male users in terms of the number of users they were connected to. Women, however, sent communications outwardly to significantly more users than men and women received information from significantly more sources than men. In Bahrain, the most prominent female Twitter users were far less connected to other users than their male counterparts and communicated less frequently.

³³¹ Khamis and Vaughn, "Cyberactivism in the Egyptian Revolution," 17; see Chapter IV.

³³² Yadav, "Tawakkul Karman as Cause and Effect;" Clark, *Islam, Charity, and Activism*, 137–139.

³³³ Radsch, "Unveiling the Revolutionaries," 12, 21–22.

A comparison of the greater volume of communication women in Egypt as compared to men, as well as the smaller volume of communication women in Bahrain compared to men, may have enabled women in Egypt to influence the protests more than women in Bahrain. In influencing protests, these women may have had a greater effect on factors related to protest success. In terms of nonviolence, if women do have a preference for nonviolence, they may have expressed this to a broader audience.

The Twitter data indicates that the most significant contribution women provided by participating in the Arab Spring protests was diversity. Women in both countries followed a significantly higher number of Twitter accounts, thus gaining access to more numerous and potentially diverse sources of information. In Egypt, women also communicated to more unique users than men, thus providing their own thoughts and ideas to a wider audience as well as relaying the Tweets of others. In Bahrain, women communicated with fewer unique users and were more peripheral in communications networks. While women had access to more sources of information than men, they relayed their own thoughts or Retweeted others' ideas less frequently than men. In Yemen, while not on Twitter, women organized protests and were able to engage networks throughout civil society to facilitate diversity and innovation within the social movement. The connection of women to more diverse sources of information in all three countries, via virtual or physical networks, facilitates their contributions to diversity and innovation within a protest movement.

Studies of networks show that a small group of members often produce the majority of the work, and that the diversity and size of this group determine the effectiveness of a network.³³⁴ Studies also indicate that increased participation inspires more participation in an interactive network, thus increasing the potential for collective

³³⁴ Oliver, et al, "A Theory of the Critical Mass. I.," 524; Oliver and Marwell, "A Theory of the Critical Mass. II," 1.

action.³³⁵ Thus participation of women in addition to men in the Twitter data may have contributed to increased diversity and effectiveness of the Twitter networks, as well as encouraged participation in collective action.

Another factor in protest success, cohesive group identities, can be reinforced through the use of symbols, frames, and narratives. In the case of Twitter networks, Hashtags can serve as symbols and mobilizing frames, and the content of the Tweets fosters a narrative among online activists. In the Egypt data, women employed protest-related Hashtags in more than half of their Tweets, whereas men employed the same Hashtags much less. Nearly 52 percent of women's Tweets employed at least one protest-related Hashtag, whereas only 38 percent of male Tweets employed a protest-related hashtag.³³⁶ Thus, women reinforced a very specific protest frame (#Jan25) more often among the online activists than their male counterparts. Not only did this behavior contribute to group identity, it increased the volume of Tweets about the protests more than if the network only had male participants. Additionally, women in Egypt had their messages Retweeted to other users in higher percentages than men, which indicates that the narratives women choose to express or relay, reached a wider audience than their male counterparts. In Egypt, female Twitter users reinforced the mobilization frames and shaped the protest narratives, doubling the quantities of protest-related messages.

In Bahrain, women communicated less, and appeared to be equal to men in their use of protest-related Hashtags; however, they communicated less and were also less Retweeted than male Twitter users. While female participation added to the volume of messages reinforcing protests narratives and frames, there was not a substantial difference between male and female contributions to group identity. If anything, women reached a smaller audience than men through their Tweets and their contributions to group identity were comparatively smaller.

³³⁵ Markus, "Toward a 'Critical Mass,'" 499.

³³⁶ While this does not exclude the possibility of other protest-centric Hashtags, for example "#egypt," female Tweepers used the protest date Hashtags more often, invoking a specific protest frame in their messaging.

Another significant area of contribution was communication. Women in Egypt communicated more often to more users and a higher percentage of their messages were focused on protest-related activity. These frequent communications helped information about protests reach a wider, more diverse audience than male-only communications. Also, men within the Egypt data set received more communications than women did. This could mean that while women received information from more sources and broadcast their ideas and information to more people, they also had a better chance of reaching male Twitter users with higher authority or influence, to include individuals planning and coordinating the protest activity.

In Bahrain, women communicated less frequently and to fewer individuals than men did. While women added to the volume of protest-related communication, their communications did not reach as far as their male counterparts. Female contributions to protest-related communications were lower in Bahrain than in Egypt during the Arab Spring.

Frequent communication about protests to a wide audience can engender support and encourage participation in protest activity, thus lowering barriers to protest. A sense of strength in numbers, communications about the level of violence, or requests for supplies and support can shape protest participation. In terms of sheer volume and diversity of communication, the women using Twitter to communicate protest-related matters, when combined with their male counterparts, added to the protest-related messaging. These messages informed people about upcoming events, safety information, and potentially added to the perceived size of the protest. The frequency and reach of this information may have helped lower the barriers to protest. In Egypt, women contributed to that frequency and reach. In Bahrain, women contributed less to the volume of communication in Twitter networks, and thus relayed less information about the protests to include safety or event information.

Ultimately, whether the protests succeeded or not, women were successful in contributing to the numbers and volume of protest related traffic online. In the real world, women were planners, coordinators, and reporters. Their constant communication

and connection to multiple sources and recipients of information, in addition to their male counterparts, influenced the relative success of the Arab Spring protests in Egypt, Yemen, and Bahrain.

B. AREAS FOR FUTURE RESEARCH

The data set explored represents a fraction of protest activity during the Arab Spring. Additional data sets for the same timeframe using different search parameters including location and Hashtag information could be used to amplify these findings. Analyzing Retweets and the spread of specific messages or links could provide additional indicators of influence among the users in the data set.

Furthermore, this data set represents only one social networking program employed by protestors. Twitter is used to broadcast information and updates, however, websites like Facebook were used for longer-term planning among activists.³³⁷ An analysis of other programs, Facebook in particular, would shed considerable light on the online protest social network and its influencers.

Finally, an analysis of these networks since the Arab Spring, given the rise in social network account holders in the Middle East and the rising popularity of these programs, could also provide clues as to whether women have gained, maintained, or lost influence in online social networks since early 2011.

C. CONCLUSION

This thesis concludes that women did participate in the Arab Spring protests in both on an offline. In Egypt, Yemen, and Bahrain, women physically mobilized to participate in protests. Women in Yemen, however, did not mirror their actual mobilization with virtual mobilization due to a lack of access and training throughout the country. Instead, Yemeni women relied on traditional social mobilization tactics and organized protests through extensive social networks built through civil society. As organizers, women were involved in selecting nonviolent protest repertoires, employing

³³⁷ “Arab Social Media Report: Civil Movements: The Impact of Facebook and Twitter,” in *Arab Social Media Report* (Dubai: Dubai School of Government, 2012), 4–5.

diversity and innovation in their protests, creating cohesive identities, frames, and symbols, and finding ways to lower barriers to protest.

In Egypt and Bahrain, women mobilized physically as well as virtually by using social media tools such as Facebook, Blogs, and Twitter micro-blogs. Twitter data from the Arab Spring protests illustrates differences between male and female online protest activity that may have shaped elements of the protests. In general, women directed communications out to other users more than men, while men received more communications from other users. Additionally, women followed significantly more Twitter users, indicating that they receive information from more diverse information sources.

In Egypt, where women were present in Tahrir Square, they accounted for almost half of the most connected Egyptian Twitter users in the data set. Additionally, women broadcast information to nearly twice as many users as men did. In contrast, men received nearly three times more information from users than women. Egyptian women also followed more than four times as many accounts than men did, thus having access to more diverse sources of information. In the Egypt data set, women not only received more information, but distributed that information more often. Thus women's participation online potentially contributed to the numbers of users and messaging, the diversity of message content, and the amount of information communicated.

Women in Bahrain also physically mobilized and faced regime repression, intimidation, and arrests alongside their male counterparts. Virtually, however, they were significantly less prevalent in the Twitter data set, accounting for only 17 percent of the most connected Bahraini Twitter users; by comparison, men in Bahrain comprised fifty percent of the most connected users. While female Twitter users in Bahrain still broadcast information out to others slightly more often than they received information, the male Twitter users broadcast and received the majority of messages. Women in Bahrain followed nearly six times more users than their male counterparts; however, they relayed that information as well as their own thoughts much less than Egyptian women. Bahraini women also appeared as less central players in Bahrain's Twitter protest

communications. While women in Bahrain employed Twitter and social media to participate in the protests, they were less prevalent in the Twitter data set than men in Bahrain.

While each country's Arab Spring has a different narrative of success, failure, and regime repression, women in Egypt, Yemen, and Bahrain played a role in each story. Taking to the streets and to the web, women contributed to the protests by mobilizing their own social networks, promoting nonviolent repertoires, adding diverse opinions and skills, and communicating to a wide audience through social media. As Egypt, Yemen, and Bahrain adjust to the aftermath of the Arab Spring, many female activists may find new and innovative ways to Tweet, Blog, and otherwise express their voices in the public sphere.

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APPENDIX. METHODOLOGY

The data set analyzed consisted of full individual Tweet retrieval from protest-centric Tweets originating from the countries of interest from the end of January to the end of February 2011. A two-week time period for country was identified, representing Twitter activity prior to, during, and after the protests. Once the data was structured, each data set was imported into Organizational Risk Analyzer (ORA) and Gephi, software programs used for visualizing social networks and computing measurements of influence for individuals and groups within social networks. Each program employs different methods of calculating similar scores and provides different features, thus using two programs helps validate the data and answer specific questions.

The Twitter networks are considered directed, as each Tweet is a one-way communication. These networks are also asymmetric because not every individual communicating with another Twitter user receives a communication in return (an example of this would be spamming or group messages). The networks are also considered *scale-free* as a small portion of the users create the largest portion of the messaging, and many users only connect to a small number of users while a few users connect to a large group associates.³³⁸ Essentially a few people reach out to many, while many people reach out to few. Thus, the predominant Twitter users were identified in each data set by high degree centrality, or many links to other accounts. Each user's profile was queried through the Twitter search function.³³⁹ As there is no definitive way to verify gender online, gender was determined by any one, or combination of, gender specific name, gender specific photo, user description of gender, or an embedded URL that linked to a blog or Facebook page with identifiable gender. Profiles with no identified gender were noted, but not further analyzed. Translations of Arabic words found on the profiles were done using Google Chrome's translate function.

³³⁸ Hands, @ *Is For Activism*, 119.

³³⁹ Twitter Search Webpage, retrieved on May 15, 2013, from <http://search.twitter.com>.

Following the identification of genders, the top male and female Twitter accounts originating in the country of interest were extracted to compare their potential influence in the Twitter network. Network influence was assessed through centrality scores created by weighting links and connections throughout the network.³⁴⁰ Twitter networks may not reflect a network of strong social ties, thus centrality scores are only a partial indicator of influence. To provide additional indicators of potential influence, other factors such as number of contacts, Tweets, Retweets, and growth of friends and followers were analyzed. These patterns and centrality scores were compared to determine the differential impact of women within this Arab Spring Twitter data set.

A. DATA SET

The data set was acquired from Topsy Labs, Inc, and contained a comma-separated values file of 131,512 individual Tweets selected based upon date, protest-Hashtag, and location data. The data is a large sample of Tweets collected and identified as originating in Egypt, Yemen, or Bahrain from January 23, 2011 until February 22, 2011 using at least one of the identified protest-related Hashtags.³⁴¹ Each of these data sets was broken down into a two-week period surrounding the protest event (Table 1)

The Twitter data was delivered in a comma-separated values file format (59.6Mb), consisting of fields related to user profile information, location data, full Tweet message text, time of message creation, and other fields identified by Topsy Labs (Table 3).

B. DATA STRUCTURING

The data was first structured in order to remove empty fields, transform dates and times into formats that analysis programs could process, and remove potential errors. This data structuring and refinement was conducted with Google Refine and Microsoft

³⁴⁰ For the purpose of social network analysis, these Twitter networks are considered asymmetric and directed, wherein each individual may not talk to the same number of individuals and each Tweet represents a one-way communication that may or may not generate a response.

³⁴¹ Lynch, *The Arab Uprisings*, 104–112.

Excel. Unnecessary fields that did not contain data essential to analysis were removed from the file. The text of the Tweets was sorted to extract usernames and Hashtags into separate columns for importing into analysis programs. The usernames mentioned were reformatted to ensure consistency in the name formats. After exporting the file, the data was opened with Microsoft Excel to further review and refine the data. The “user.created_at” and “created_at” fields were reformatted from text to date fields in order to import the data into analysis programs. The Twitter data for Egypt, Yemen, and Bahrain was exported into separate files for analysis. After completing data structuring, the files were each imported into ORA for mapping and processing and then into Gephi.

Each transformed data set was imported into the program ORA, or Organizational Risk Analyzer. ORA takes structured social network data and uses measurements to produce reports that compare scores among actors to determine how knowledge, influence, and tasks are spread among actors in a network.³⁴² This software identifies actors whose knowledge or role in a network influences network behavior and allows the network to be manipulated and visualized.³⁴³ The data was imported and mapped with each Tweet connecting a user to the user they mention in the Tweet by either replying to a Tweet or sending a Tweet mentioning another Twitter user.³⁴⁴ Once the data was imported into ORA, standard social network analysis measurements were computed, and those scores were compared between actors to assess potential levels of influence each Twitter user exercised within the Twitter social space. Each file was then exported in a “.net” file format for use with the Gephi Program.

Once imported into Gephi, the network was again mapped in order to assess scores and visualize the network. Gephi is an open-source visualization platform that allows the user to conduct analysis and assess metrics on networks. Gephi enables the “easy creation of social data connectors to map community organizations and small-

³⁴² Everton, *Dark Networks*, 69–70.

³⁴³ Ibid., 69

³⁴⁴ Both a Tweet “In reply to” and a Tweet with an “@mention” user mention will appear in the Twitter user’s profile that the message is directed to.

world networks.”³⁴⁵ Once the data was displayed in ORA and Gephi, the centrality scores and key influencer statistics for the full network and each network by country were calculated.

C. ANALYSIS

A combination of centrality scores and user statistics were used to evaluate the activity and influence of key nodes. Users were first identified using total degree centrality as a measure of the total user each user was connected through Twitter interactions. After ordering by degree centrality scores, the users as well their scores were extracted into a separate file for comparative analysis.³⁴⁶

The fifty nodes with the highest degree centrality scores were identified to confirm gender and location through use of the Twitter online search function.³⁴⁷ If a profile had a gender-specific picture, name, statement indicating gender, or a link to Facebook page or blog, the gender of the user was recorded accordingly. The Twitter data set was also explored to find additional names and blog URLs to gain further insight and verify the Twitter search results. The location confirmation was conducted via the same method. In cases where the profile was protected, media sources, or gender and location could not be determined were ignored. The resulting data set consisted of ten male and ten female Twitter users located in the country of interest at the time of the protests. The centrality scores and the Twitter data of these users was then extracted to compare centrality scores and user information.

³⁴⁵ Gephi website, retrieved August 3, 2013, from <https://gephi.org>.

³⁴⁶ Total degree centrality is the same calculation in ORA and Gephi because the score represents the number of links to and from a node.

³⁴⁷ Twitter Website, retrieved August 15, 2013, from <http://www.twitter.com>. The quantity of nodes was selected to ensure that enough Twitter profiles were scanned to create a sample set of male and female Twitter accounts.

1. Centrality Scores³⁴⁸

Centrality scores measure the significance of a node given its location in the social space by computing links associated with the node in relation to other nodes in the network and their links, or in this case the Twitter user account in relation to other accounts in the network and their links. All scores were computed through the ORA software program's analysis capabilities that calculate various centrality scores and produce reports.

Total Degree Centrality in this network indicates the number of connections a Twitter user of interest in the network has directly to other Twitter users.³⁴⁹ This includes users who received a message from another user, individuals who a user sent a message to, and individuals mentioned in a Tweet as the Tweet shows up in their Twitter account as a "mention." The count of a user's ties in a Twitter network may indicate a user's potential as a source of information as well as their ability to influence communications vis-à-vis their Twitter network and the Twitter networks of those they Tweet to.³⁵⁰ This calculation was used to determine potentially significant Twitter users in the network and isolate them for additional analysis.

In-degree Centrality indicates the number of directed links pointing to the user of interest.³⁵¹ In this data set, this represents the number of accounts who sent Tweets to the account of interest. The in-degree scores may indicate a potential source of information or authority.³⁵² An example of this function would be when many users pass information to these users of interest and the information subsequently gets Retweeted to a broader audience. These scores were used to identify potential sources of information within the Twitter networks.

³⁴⁸ Everton, *Dark Networks.*, 397–403; Carley, Kathleen M & Pfeffer, Jürgen & Reminga, Jeffrey & Storrick, Jon & Columbus, Dave. ORA Help Manual Glossary(2013); ORA User's Guide. *Carnegie Mellon University, School of Computer Science, Institute for Software Research, Technical Report, CMU-ISR-13-108*,

³⁴⁹ Everton, *Dark Networks*, 208–209; "ORA User's Guide," 18.

³⁵⁰ "Ora User's Guide," 1178–1180.

³⁵¹ Everton, *Dark Networks*, 401.

³⁵² "Ora User's Guide," 8.

Out-degree Centrality indicates the number of outbound links from the user of interest.³⁵³ These links may include original Tweets as well as Retweets. Depending on the networks receiving the Tweets, an individual with high out-degree centrality may communicate with a wider population than an individual with lower out-degree centrality.³⁵⁴ Individuals with high out-degree centrality may be influencers themselves or want to be influencers within a network; their actual level of influence is determined by how far their message spreads via their followers and their followers Retweets of the message.³⁵⁵ This score was used to determine which users passed information out to more nodes in the network.

Authority Centrality identifies users who are potentially connected to more good sources of information, or Hubs. By contrast, *Hub Centrality* identifies which users are more connected to individuals who can disseminate that information.³⁵⁶

Betweenness Centrality, which describes the proximity of users on the shortest path between other users in the social space were evaluated as well. These centrality scores were used to compare the networks of the most connected male and female Twitter users to determine their potential influence and access to information.³⁵⁷

2. User Activity Measures

Activity for each user was assessed via fields collected from historical Twitter data. Each individual Tweet can contain information about the user and their location, number of followers, accounts they are following, dates and times of transmission, the language used in the Tweet, Retweets, and the method an individual used to submit the Tweet. These values can indicate how many Twitter users follow an account and can

³⁵³ Everton, *Disrupting Dark Networks*, 401.

³⁵⁴ “Ora User’s Guide,” 14.

³⁵⁵ Ibid, 1178–1180.

³⁵⁶ Everton, *Dark Networks*, 242, 400.

³⁵⁷ Ibid., 210, 397.

view Tweets from that individual, how many accounts a user follows and can view information from, how a user posts their Tweets, and the general location they may post Tweets from.

The first quantity assessed was the number of Tweets users sent during the two-week timeframe based on the search criteria and protest Hashtags. The total number of Tweets sent by each user, is identified in the difference between the highest and lowest user status number. The difference between the collected Tweets and Tweets sent indicates how many Tweets were marked with the search criteria, and how many Tweets were not. This difference provides a general point of comparison, but does not illuminate whether other Hashtags that were protest related were used (i.e., #Tahrir, #PearlSquare).

Then the number of followers, and the percentage in growth of followers during the time period was assessed for each of the users of interest. In the case of this data set, an increase in followers may indicate an increase in the potential audience a user can reach with their Tweet and serves as a measure of direct influence.³⁵⁸ Additionally, the number of accounts a user is following was also assessed. This indicates the range of potential information sources that a user can access. The numbers of and change in followership and accounts being followed for each user provides an indication of the quantity, and potential diversity of, information sources a user has access to. Finally, the number of Retweets and percentage of collected Tweets Retweeted was reviewed to determine how widely retransmitted messages were, which can also indicate how influential a Twitter user is. In reviewing the metadata accompanying the Twitter messages, amplifying information about each user's activity and influence can be used to compare users.

The centrality scores and activity measures were totaled and averaged for each group of male and female users to compare differences in centrality, influence, and

³⁵⁸ "ORA User's Guide," 1178–1180.

activity. These comparisons, while not a complete picture of user activity, can provide some indications of differences in influence and activity between male and female Twitter accounts.

D. CHALLENGES

The data set represents a one-time query of the historical Twitter archives. Due to the nature of the query, the protest dates, locations, and Hashtags were combined to gain the largest sample of protest-related Tweets from the region while filtering out Tweets that did not originate from the region. It is likely that further queries of the archives and data set would produce more Tweets meeting these criteria and could refine the data for each country, date range, or Hashtag. Challenges with historical data retrieval and geoinferencing, changes in computer networks and systems, and local network measures to control or conceal online activity conducted by activists and regimes may also affect the completeness of this specific data set. Future queries, research, and additional data retrieval could help build a more robust sample size.

Access to the software programs necessary to transform and analyze the data was also limited. ORA has a Twitter analysis function; however, it is limited to new versions of the software and requires specific data formats. Palantir, a tool designed for big data mining and visualization is also developing and deploying its own Twitter analysis capability. These software packages will be useful for anyone conducting future research.

Additionally, gender identification and language translation also proved difficult. This could be improved via translation services and conducting interviews with individuals. These activities are outside the scope of this research project.

Table 5. Query Parameters and Results

	Protest Dates	Protest Hashtags*	Number of Tweets	Number of Users	Number of Links
Egypt	Jan 23, 2011 Feb 6, 2011	#Jan25 OR #Yemen OR #Feb3 OR #Feb14	73,815	11,969	39,517
Yemen	Jan 26, 2011–Feb, 10, 2011		148	111	115
Bahrain	Feb 7, 2011–Feb, 21, 2011		10,557	2,364	4,740
Total Data Set	Jan 23, 2011–Feb 22, 2011		131,512	15,756	59,271

* Note that Tweets frequently contain more than one Hashtag, many Tweets incorporated more than one of the listed Hashtags, along with Hashtags not listed here, when referencing the Arab Spring. An example would be Tweets about the Arab Spring Hashtagged “#Jan25, #Egypt, #25Jan” or “#Jan24, #Feb14, #Protest.”

Table 6. Mapping Fields: Agent x Agent Network

	User Screen Name	User Mention 1–11
ORA	Agent	Agent
Gephi	Node	Node

Table 7. Topsy Fields Used for Analysis³⁵⁹

Field	Description	Comment
User.screen_name	User's screen name.	Self-Identified
User.name	User's name	Self-Identified
User.created_at	When the user account was created	System Generated
User.followers_count	Number of followers for the user	System Generated
user.friends_count	Number of Twitter accounts the user is following	System Generated
User.created_at	When the account was created.	System Generated
created_at	Date and Time of Tweet Creation.	System Generated
in_reply_to_screen_name	For Tweets that are Replies, this is the account the Tweet is replying to.	Generated by user activity.
in_reply_to_status_id_str	String of Tweet being replied to.	Generated by user activity.
Retweet_count	Number of Retweets the user's Tweet received.	System Generated
Source.	Method used to post the Tweet	Generated by user activity.
User.description	Biographic information.	Self-Identified
User.statuses_count	The number of Tweets for the user	Generated by user activity.
User.lang	The language selected by the user	User Generated
User.location	Self-described user location	User Generated
Topsy.document_info.lang	Topsy identified language	System Generated

³⁵⁹ Fields provided by Topsy Labs, Inc in the Full Tweet Retrieval JSON Field Guide.

LIST OF REFERENCES

- Aday, Sean, Henry Farrell, Marc Lynch, John Sides, and Deen Freelon. "Blogs and Bullets II: New Media and Conflict after the Arab Spring." *Peaceworks*. U.S. Institute of Peace. 2012. Retrieved November 15, 2012.
<http://www.usip.org/files/resources/PW80.pdf>.
- Adrianson, Lillemor. "Gender and Computer-Mediated Communication: Group Processes in Problem Solving." *Computers in Human Behavior* 17, no. 1 (2001): 71–94.
- al-Kamali, Zakaria. "Yemen's Women: Toppling Tradition." *Al Akhbar English*. October 10, 2011. <http://english.al-akhbar.com/node/1023>.
- al-Muslimi, Farea. "The Social Transformation of Yemen's Youth Revolution." *Al Montior*. March 8, 2013. <http://www.al-monitor.com/pulse/politics/2013/04/transformations-youth-yemen.html>.
- Aleryani, Hind. "Yemen's Revolutionary Women under Attack." *Comment Middle East*. Last modified March 12, 2013. <http://commentmideast.com/2013/03/yemen-revolutionary-women-under-attack/>.
- Alwazir, Atiaf. "Social Media in Yemen: Expecting the Unexpected." *Al Akhbar English*. Last modified December 30, 2011. <http://english.al-akhbar.com/content/social-media-yemen-expecting-unexpected>.
- Aminzade, Ronald R. and Doug McAdam. "Emotions and Contentious Politics" in *Silence and Voice in the Study of Contentious Politics*, edited by Ronald Aminzade, 14–51. Cambridge, UK: Cambridge University Press, 2001.
- Amensty International. "Flawed Reforms: Bahrain Fails to Achieve Justice for Protesters." Amnesty International. 2012. Accessed June 23 2013.
<http://www.amnesty.org/en/library/info/MDE11/014/2012/en>.
- . "Livewire." Retrieved August 9, 2013.
<http://livewire.amnesty.org/?s=bahrain&lang=en>.
- . "Meeting Human Rights Activists from Bahrain on World Day for the Victims of Torture." *Amnesty's Global Human Rights Blog*. Retrieved August 9, 2013.
<http://livewire.amnesty.org/2013/06/28/meeting-human-rights-activists-from-bahrain-on-world-day-for-the-victims-of-torture/>.
- Anklam, Patricia. *Net Work: A Practical Guide to Creating and Sustaining Networks at Work and in the World*. Amsterdam, NL: Elsevier/Butterworth-Heinemann, 2007.

- “Arab Social Media Report: The Role of Social Media in Arab Women’s Empowerment.” In *Arab Social Media Report*. Dubai: Dubai School of Government, 2011.
- “Arab Social Media Report: Civil Movements: The Impact of Facebook and Twitter.” In *Arab Social Media Report*. Dubai: Dubai School of Government, 2012.
- Asal, Victor, Richard Legault, Ora Szekely, and Jonathan Wilkenfeld. “Gender Ideologies and Forms of Contentious Mobilization in the Middle East.” *Journal of Peace Research* 50, no. 3 (May 1, 2013): 305–18.
- Bahrain Center for Human Rights. “Webpage and Twitter Feed.” Retrieved August 4, 2013. <http://www.bahrainrights.org/en/about-us>.
- Boyer, Mark A., Brian Urlacher, Natalie Florea Hudson, Anat Niv–Solomon, Laura L. Janik, Michael J. Butler, Scott W. Brown, and Andri Ioannou. “Gender and Negotiation: Some Experimental Findings from an International Negotiation Simulation.” *International Studies Quarterly* 53, no. 1 (2009): 23–47.
- Castells, Manuel. *Networks of Outrage and Hope*. Cambridge, UK: Polity Press, 2012.
- Chenoweth, Erica and Maria J. Stephan. *Why Civil Resistance Works: The Strategic Logic of Nonviolent Conflict*. New York: Columbia University Press, 2011.
- Clark, Janine A. *Islam, Charity, and Activism: Middle–Class Networks and Social Welfare in Egypt, Jordan, and Yemen*. Bloomington, IN: Indiana University Press, 2004.
- Clemens, Elisabeth S. “Organizational Repertoires and Institutional Change: Women’s Groups and the Transformation of U.S. Politics, 1890–1920.” *American Journal of Sociology* 98, no. 4 (1993): 755–98.
- Colombo, Silvia. “The GCC Countries and the Arab Spring, between Outreach, Patronage and Repression.” Instituto Affari Internazionali (IAI) Working Papers, 2012. Retrieved June 23, 2013. <http://www.iai.it/pdf/DocIAI/iaiwpl209.pdf>.
- d’Estrée, Tamra Pearson, and Eileen F. Babbitt. “Women and the Art of Peacemaking: Data from Israeli–Palestinian Interactive Problem–Solving Workshops.” *Political Psychology* 19, no. 1 (1998): 185–209.
- Della Porta, Donatella and Mario Diani. *Social Movements: An Introduction*. Oxford: Blackwell, 1999.
- Dewey, Taylor, Juleian Kaden, Miriam Marks, Shun Matsushima, and Beijing Zhu. “The Impact of Social Media on Social Unrest in the Arab Spring.” Stanford University, 2012. Retrieved October 15, 2012. http://publicpolicy.stanford.edu/.../SocialMedia_FINAL 20 Mar.pdf.

- Ebrahim al Sayed, Yara. "Testimonies from Bahrain: My Father, the Activist." *Amnesty's Global Human Rights Blog*. Last modified September 26, 2011.
<http://livewire.amnesty.org/2011/09/26/bahrain-testimonies-my-father-the-activist/>.
- Escobar, Arturo, "Gender, Place and Networks: A Political Ecology of Cyberculture." In *Women@ Internet: Creating New Cultures in Cyberspace*, edited by Wendy Harcourt. London: Zed Books, 1999. 31-55.
- Everton, Sean F. *Disrupting Dark Networks*. New York: Cambridge University Press, 2012.
- Fisher, H. *The First Sex: The Natural Talents of Women and How They Are Changing the World*. New York: Random, 1999.
- Freelon, Deen. Blog post containing Twitter Archive for #Jan25. Retrieved July 23, 2013.
<http://dfreelon.org/blog>.
- Hadota. "Text Communication Any Egyptian Can Submit to the Attorney General Against Anas el." *Hadota*. February, 9, 2011. Retrieved August 1, 2013.
http://hadouta.blogspot.com/2011_02_01_archive.html.
- Hadota. "The Demands of the Egyptian Revolution From Tahrir Square." *Hadota*, February, 10, 2011. Retrieved August 1, 2013.
http://hadouta.blogspot.com/2011_02_01_archive.html.
- Harcourt, Wendy, ed. *Women@ Internet: Creating New Cultures in Cyberspace*. London: Zed Books, 1999.
- HARASSmap. HARASSmap Website. Retrieved August 3, 2013.
<http://www.harassmap.org/en>.
- HARASSmap. HARASSmap Facebook Page. Retrieved August 3, 2013.
<https://www.facebook.com/HarassMapEgypt?ref=stream>.
- HARASSmap. HARASSmap Twitter Page. Retrieved August 3, 2013.
<https://twitter.com/harassmap>.
- Howard, Philip N., Aiden Duffy, Deen Freelon, Muzammil Hussain, Will Mari, and Marwa Mazaid. "Opening Closed Regimes: What Was the Role of Social Media During the Arab Spring." Project on Information Technology and Political Islam, 2011. Retrieved October 15, 2012,
http://dl.dropbox.com/u/12947477/publications/2011_Howard-Duffy-Freelon-Hussain-Mari-Mazaid_pITPI.pdf
- International Crisis Group. "Popular Protest in North Africa & the Middle East (I): Egypt Victorious?" *Middle East/North Africa Report*, no. 101 (2011): 24.

- . “Popular Protest in North Africa & the Middle East (Ii): Yemen between Reform and Revolution.” *Middle East/North Africa Report*, no. 102 (2011): 25.
- . “Popular Protest in North Africa & the Middle East (Iii): The Bahrain Revolt.” *Middle East/North Africa Report*, no. 105 (April 6, 2011): 28.
- International Federation for Human Rights. “Women and the Arab Spring: Taking Their Place?” International Federation for Human Rights. 2012. Retrieved July 9, 2013. http://arabwomenspring.fidh.net/index.php?title=Main_Page.
- Jubran, Jamal. “Bushra Al-Maqtari: Writing the Yemeni Revolution.” *Al Akhbar English*. Last Modified December 31, 2011. <http://english.al-akhbar.com/node/2940>.
- Kajeski, Jenna. “Women Are a Substantial Part of Egyptian Protests.” *The Slate*. Last modified January 27, 2011. http://www.slate.com/blogs/xx_factor/2011/01/27/egyptian_protests_women_are_a_substantial_part.html.
- Khamis, Sahar, and Katherine Vaughn. “Cyberactivism in the Egyptian Revolution: How Civic Engagement and Citizen Journalism Tilted the Balance.” *Arab Media and Society* 13 (summer 2011): 1–36. Retrieved May 1, 2013, http://www.arabmediasociety.com/countries/index.php?c_article=249.
- Laschever, Sara, Linda Babcock, *Women Don’t Ask: Negotiation and the Gender Divide*. Princeton, NJ: Princeton University Press, 2008.
- Lynch, Marc. *The Arab Uprising: The Unfinished Revolutions of the New Middle East*. New York: Public Affairs Store, 2013.
- Maoz, Ifat. “The Women and Peace Hypothesis? The Effect of Opponent Negotiators’ Gender on the Evaluation of Compromise Solutions in the Israeli–Palestinian Conflict.” *International Negotiation* 14, no. 3 (2009): 519–36.
- Martin, Michel. “Women Play Vital Role in Egypt’s Uprising.” National Public Radio. February 4, 2011. <http://www.npr.org/2011/02/04/133497422/Women-Play-Vital-Role-In-Egypt-Uprising>.
- Middleton–Detzner, Althea M, and Jillian M. Slutzker, Samuel F. Chapple–Sokol, and Sana A. Mahmood. “Women and the Egyptian Revolution: A Dream Deferred?” *The Palestine–Israel Journal of Politics, Economics, and Culture* 17, no. 3&4 (2011): 106–15.
- Moghadam, Valentine M. *Globalization and Social Movements: Islamism, Feminism, and the Global Justice Movement*. Lanham, MD: Rowman & Littlefield, 2009.

- Naib, Fatma. "Karman: Peaceful Revolution 'Only Solution.'" *Al Jazeera English*. Last modified October 8, 2011.
<http://www.aljazeera.com/indepth/features/2011/10/2011107172033851656.html>.
- Newsom, Victoria A, and Lara Lengel. "Arab Women, Social Media, and the Arab Spring: Applying the Framework of Digital Reflexivity to Analyze Gender and Online Activism." *Journal of International Women's Studies* 13, no. 5 (2012): 31–45.
- Pearlman, Wendy. *Violence, Nonviolence, and the Palestinian National Movement*. Cambridge, UK: Cambridge University Press, 2011.
- Radsch, Courtney. "Arab Media: Unveiling the Revolutionaries: Cyber Activism and the Role of Women in the Arab Uprisings." Rice University: James A. Baker III Institute for Public Policy, 2012. Retrieved October 1, 2012,
<http://www.radsch.info/2012/05/unveiling-revolutionaries-cyberactivism.html>.
- Samir, Zeinab. "January 25." *Egyptian Girl* (blog). January 20, 2011. Retrieved August 1, 2013.
<http://www.bentmasreya.net/search/label/%D9%A2%D9%A5%20%D9%8A%D9%86%D8%A7%D9%8A%D8%B1>
- Samir, Zeinab. "For a Complete Revolution. Statement." *Egyptian Girl* (blog). February 25, 2011. Retrieved August 1, 2013.
<http://www.bentmasreya.net/search/label/%D9%A2%D9%A5%20%D9%8A%D9%86%D8%A7%D9%8A%D8%B1>
- Savicki, Victor, and Merle Kelley. "Computer Mediated Communication: Gender and Group Composition." *CyberPsychology & Behavior* 3, no. 5 (2000): 817–26.
- Schleusener, L. "From Blog to Street: The Bahraini Public Sphere in Transition." *Arab Media and Society*, 1. February 2007.
http://www.arabmediasociety.com/countries/index.php?c_article=34.
- Seif, Mona. "Long live the Revolution of the Egyptian People." *Ma3t's Bits and Pieces* (blog). January 30, 2011. Retrieved August 3, 2013,
http://ma3t.blogspot.com/2011_01_01_archive.html.
- _____. "Another Testimony of Military Brutality on Protestors." *Ma3t's Bits and Pieces* (blog). February 28, 2011. Retrieved August 3, 2013, from
http://ma3t.blogspot.com/2011_02_01_archive.html.
- _____. "@Monasosh" Twitter posts from January 30–February 2, 2011. Retrieved August 3, 2013.
<https://twitter.com/search?q=from%3Amonasosh%3A%20since%3A2011-01-25%20until%3A2011-02-05&src=typd>

- Skalli, Loubna H. "Communicating Gender in the Public Sphere: Women and Information Technologies in the Mena Region." *Journal of Middle East Women's Studies* 2, no. 2 (2006): 35–39. Retrieved November 15, 2012.
http://muse.jhu.edu/journals/journal_of_middle_east_womens_studies/v002/2.2skalli.html.
- Stephan, Maria J and Erica Chenoweth. "Why Civil Resistance Works: The Strategic Logic of Nonviolent Conflict." *International Security* 33, no. 1 (2008): 7–44. Retrieved November 1, 2012.
http://muse.jhu.edu/journals/international_security/v033/33.1.stephan.html.
- Taher, Nadia. "We Are Not Women, We Are Egyptians." Opendemocracy. Retrieved August 3, 2013. <http://www.opendemocracy.net/5050/nadia-taher/we-are-not-women-we-are-egyptians-spaces-of-protest-and-representation>.
- West, Guida, and Rhoda Lois Blumberg. *Women and Social Protest*. New York:Oxford University Press, 1991.
- Yablon, Yaacov B. "Gender Differences in the Consistency of Attitudes Towards Peace." *Women's Studies International Forum* 32, no. 4 (2009): 305–10. Retrieved November 23, 2012.
<http://www.sciencedirect.com/science/journal/02775395/32/4>.
- Yadav, Stacey Philbrick. "Countries in Crisis 2012: Yemen." Freedomhouse Report. 2012. Retrieved July 9, 2013, from
<http://www.freedomhouse.org/report/countries-crossroads/2012/yemen-0>.
- . "No Pink Slip for Salih." *Middle East Research and Information Project* (2011). Retrieved May 15, 2013, from <http://www.merip.org/mero/mero020911>.
- . "Tawakkul Karman as Cause and Effect." *Middle East Research and Information Project* (2011). Retrieved August 3, 2013, from
<http://www.merip.org/mero/mero102111>.
- Zeinobia. "#Jan29: After the 28th." *Egyptian Chronicles* (blog). January 29, 2011. Retrieved August 3, 2013.
<http://www.egyptianchronicles.blogspot.com/2011/01/jan-29-after-28th.html>.
- . "@Zeinobia" Twitter posts from January 30– February 2, 2011. Retrieved August 3, 2013.
<https://twitter.com/search?q=from%3Azeinobia%3A%20since%3A2011-01-30%20until%3A2011-02-02&src=typd>

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